Submission No 49

PREVENTION OF CRUELTY TO ANIMALS AMENDMENT (VIRTUAL STOCK FENCING) BILL 2024

Organisation: RSPCA NSW

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Committee on Investment, Industry and Regional Development
Prevention of Cruelty to Animals Amendment (Virtual Stock Fencing) Bill 2024
SUBMISSION - RSPCA NSW

DATE 17 May 2024

That the Committee inquire into and report on the Prevention of Cruelty to Animals Amendment (Virtual Stock Fencing) Bill 2024, with particular reference to:

(a) the provisions of the bill,

See response to c)

(b) the animal welfare, biosecurity and community safety implications of permitting virtual fencing,

This response focuses on the animal welfare implications of virtual fencing (VF).

The impact of aversive training techniques on animals

An electric shock is an aversive stimulus. To change behaviour, an aversive stimulus must have an unpleasant effect of sufficient intensity to override the motivation to undertake the behaviour that is seeking to be suppressed or extinguished. Where aversive stimuli, or punishments, are used on animals, the impact on the animal depends, firstly, on the way it is delivered. These variables include:

- the magnitude of the aversive stimuli
- imminence of the stimuli (how quickly it is related to the behaviour)
- certainty of the stimuli (how predictable the punishment is in terms of timing and context, including whether there is a reliable signal for the event)
- the degree of behavioural control that an animal has over a stressor
- if the behaviour being suppressed is an inherent behaviour (such as seeking food, shelter or social interaction), or a learned behaviour

In addition to the way the aversive stimuli are delivered, characteristics of the individual animal receiving the stimuli will determine the impact on the animal. The resilience of an animal to punishment is influenced by their genetics and previous experience, including the extent to which they have experienced punishment or aversive treatment previously. These factors are not ever completely or reliably known about an animal meaning that the full impact of the aversive treatment on an animal cannot be predicted with certainty.

Physical punishment can cause varying degrees of pain, fear, stress, anxiety, hypervigilance and even physiological harm/illness. For these reasons, there is a risk of causing harm when using aversive stimuli on animals. So, where animals can be handled, trained and managed without aversive stimuli this should be the preference as there can be greater confidence that no harm is being done.

Where aversive stimuli are used, the chance of doing harm is reduced where the magnitude of the stimulus is low, there is a predictable, reliable signal associated with the stimuli and the individual animal has control to avoid the stimuli. It is apparent that the currently available VF technologies have considered these features in their design.

Virtual fencing and animal welfare risk

Notwithstanding the production benefits associated with virtual fencing technology, the potential for negative animal welfare consequences remains significant. The risks are associated with; the aversiveness of the electric shocks, individuals who have difficulty learning to avoid the shocks, the psychological impact of suppressing innate, strong motivations to access high value feed, shade, straying offspring or water, and adverse incidents associated with the collars. Despite the highly controlled and supervised research and testing environments, the available research indicates that these risks are not just theoretical.

Cattle have been reported to receive an average of 2.5 (range 1-6) electric shocks before starting to respond to the audio cue alone.[1] There is individual variation in how quickly cattle learn to avoid the electric shock and how often they interact with the virtual boundary. In one 27-day long experiment, the median number of electric shocks received by Angus steers was generally around 20 over the trial period, but in one paddock it was closer to 45 (figures extrapolated from graphs).[2] Some individuals received more than 50 electric shocks over the trial period.[3] Even after they have learnt how to avoid the electric shock, some animals may still receive relatively high numbers of shocks (>10) on some days, which some authors theorise may be due to an increase in motivation to cross the virtual boundary.[4] This could be the case when, for example, animals want to access resources such as pasture, shelter or shade that are outside the virtual boundary.

When comparing groups contained using VF with traditional electric tape fencing, cattle in VF groups have been reported to lay down for less time than cattle fenced with electric fencing.[5] This suggests that cattle contained with VF may be more vigilant or feel less relaxed than cattle contained using electric tape fencing. No difference in faecal corticosteroid metabolites (indicators of physiological and/or psychological stress) were found between VF and electric fenced groups in one study.[6] Cattle are also known to be avoidant of areas where virtual fencing boundaries were previously set, with the same effect not seen where electrical fencing was previously experienced. This suggests that the experience of the virtual fencing was sufficiently aversive to create lasting fear memories in cattle. [7]

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[1] Campbell DLM, Lea JM, Keshavarzi H, Lee C. Virtual Fencing Is Comparable to Electric Tape Fencing for Cattle Behavior and Welfare. Front Vet Sci. 2019;6:1–13

[2] Ibid.

[3] Ibid.

[4] Ibid.

[5] Paul Koene, Pieter Hogewerf, Bert Ipema. Effects of a virtual fence on individual and social behaviour and welfare of dairy cows. In: Ingrid C. De Jong, Paul Koene, editors. Proceedings of the 7th International Conference on the Assessment of Animal Welfare at the Farm and Group Level. Wageningen, the Netherlands.; 2017. p. 210–210

[6] Campbell etal. (n1).

[7] Andrew Fisher and Amelia Cornish, Department of Agriculture, Fisheries and Forestry, **Independent scientific literature review on animal welfare considerations for virtual fencing** (updated November 2023), https://www.agriculture.gov.au/sites/default/files/documents/Independent%20scientific%20literature%20review%20on%20animal%20welfare%20considerations%20for%20virtual%20fencing.pdf.

The circumstances in which the technology is deployed and managed will directly influence the impact it has on the animals. The review commissioned by the federal Department of Agriculture, Fisheries and Forestry (DAFF) concluded that "the animal welfare implications of VF can vary depending on many factors, such as the species, herd size, pasture size and quality, access to water, interaction with humans, as well as individual animal temperament, learning ability and previous experience."[8] It is therefore essential that, if legalised, the necessary standards are in place to ensure best practice use and avoid unintended harm. Where virtual fencing technology is legally permitted, the use of collars should be subject to regulation that ensures safeguards are in place to protect the welfare of animals. This includes adherence to standards that ensure appropriate use and avoid animal harm as well as third-party monitoring/auditing to verify compliance.

In summary, animal welfare impact will be determined by:

i) the characteristics of the particular VF technology
ii) the management of the animals subjected to VF

Therefore, to mitigate animal welfare risk, it is essential to prescribe in detail what characteristics are permissible in any technology that may be legally deployed. These include:

- the strength of the electrical stimulus, including the power and duration of the shock
- maximum shock number thresholds before cessation
- the velocity of an animal at which it will not receive a shock
- maximum threshold of consecutive shocks
- the weight of the device
- the release load break points
- compliance with relevant International Organisation for Standardisation ISO) standards, such as those related to electrical device safety
- the shape, size and angulation of boundaries that are valid
- the ability to monitor and alert critical welfare data and thresholds
- the time lag between data collection and access/reporting
- inability to manually deliver shocks

These characteristics are critical in determining the welfare impact to the animals, yet there is no way to determine, from the available research, what these thresholds should be due to the non-disclosure of these characteristics by the various producers of VF products.

The welfare of animals subjected to virtual fencing is heavily influenced by the management and supervision of those animals. Consequently, the knowledge, care and conscientiousness of those in charge of the livestock will determine animal welfare outcomes. Critical management steps include:

- placement of the collar,
- close monitoring of the acclimation/training phase including gross observation of behaviour, collar placement and fit and digital data collection

[8] Andrew Fisher and Amelia Cornish, Department of Agriculture, Fisheries and Forestry, **Independent scientific literature review on animal welfare considerations for virtual fencing** (updated November 2023), https://www.agriculture.gov.au/sites/default/files/documents/Independent%20scientific%20literature%20review%20on%20animal%20welfare%20considerations%20for%20virtual%20fencing.pdf.

- not placing collars on young, rapidly growing animals (<12months of age)
- consideration of the risk of placing collars on dams with young at foot
- regular checking of collar fit for the duration
- placing physical fencing around critical non-acesss areas and on outer boundaries
- setting reasonable boundaries that are not to small, acutely angled or with unnavigable corridors
- refraining from attempting to herd/ move animals rapidly
- the inclusion of valuable resources including sufficient feed, water, shelter
- rapid removal of animals that are non-learners

The companies producing VF make a number of recommendations to producers regarding how the devices should be used, for example, they discourage their use on juvenile animals. It is insufficient for such critical management requirements to remain as suggestions from the commercial suppliers. They must be required by law and they must be monitored and enforced if there is to be confidence that VF is used in a way that minimises the risk of distress and injury to animals.

Currently, deployments of VF have been closely managed by the companies marketing the devices. There has been careful selection of customers, personalised training, 24 hour support and support team monitoring of the data. This is important to consider for several reasons. It highlights the level of expert oversight required to mazimise successful use of the devices and it is likely to have optimised the success of any trials to date. If VF was to be legalised and have widespread commercial uptake it is unknown what level of selection, training and third-party monitoring would occur but it would seem unviable for the current level of oversight to remain in place which must be considered of significant relevance to animal welfare.

The long-term animal welfare impacts of virtual fencing are not known. Studies focusing on comprehensive welfare measures do not exist beyond 4 weeks duration. It is difficult to conclude, with any certainty, that there are no long-term welfare harms caused by VF without the available evidence to support this.

Animal welfare benefits and virtual fencing

There is no compelling evidence that that virtual fencing confers an animal welfare benefit to livestock, beyond the benefits associated with the health and behavioural data collection and reporting functionality. It is understood that this capability is important as an animal welfare mitigation in virtual fencing. However, it is worth noting that livestock wearable technologies can be used for the benefit of animal welfare monitoring without them being linked to electrical stimulus devices for containment. RSPCA NSW strongly support the development and utilisation of technology that monitors animal welfare. It would be unfortunate if the deployment of these devices was reliant only on the uptake of devices that use electrical shocks to confine cattle.

One of the aspects of VF that has been claimed, by some, to be beneficial to animal welfare is the fact that, when used for virtual herding, livestock can be moved without the use of dogs, quad bikes or humans, which are all potential stressors for cattle and sheep. However, it is unknown whether animals find the moving virtual boundary and audio cues more or less aversive than they would a stockperson, particularly a stockperson using low stress handling techniques.

Virtual fencing will likely confer a welfare benefit to wildlife by reducing the number of fences that have the potential to cause entanglements and disrupt movements. The quantum of this benefit is hard to estimate noting that external boundary fences will still remain and it is unknown what proportion of producers would utilise this technology to replace physical boundaries.

Consequently, any legalisation of the devices would be on the basis that the welfare risks are sufficiently manageable and offset by benefits to stakeholders, other than the livestock.

(c) any benefits, issues or unintended consequences raised by the bill, and whether any amendments may address those,

The bill seeks to amend the *Prevention of Cruelty to Animals Act 1979* (NSW) (**POCTAA**) to allow farmers to lawfully use virtual fencing (VF) in New South Wales. However, there are varying statutory or regulatory mechanisms capable of achieving that aim. RSPCA NSW suggests that POCTAA does not need to be amended to permit primary producers to use VF, and possibly should not be used at this stage where the animal welfare concerns remain unresolved. An alternative, and more flexibly amended mechanism could be achieved by amending the regulations at Schedule 3 to add an exception for virtual fencing, for specified purposes and used on particular stock animals. By amending the legislation rather than the regulation it makes the legal and policy setting less flexible and less responsive to developments in the science base. This flexibility is particularly important for legalising virtual fencing as there is incomplete evidence on the risks associated with its use on different animals and for different purposes (for example, the use of virtual fencing for herding versus containment).

The bill, as drafted, permits the use of any virtual fencing device that exists now, or in the future, regardless of whether it is designed with the necessary safety and welfare safeguards. It provides no limits to the intensity and duration of the shock devices meaning that devices could be deployed that risk physically as well as psychologically injuring livestock. There is no requirement to have in built monitoring and alerting functionality and no assurance that a permissible device employs a behaviourally-based algorithm that enables associative learning. Furthermore, there is no requirement that a user of the device manages the inherent risks with due knowledge and care.

To address this, the Prevention of Cruelty to Animals Regulation 2012, at Schedule 3 column 2, could exempt the circumstance of the devices use for where it is manufactured in alignment with a mandatory list of product specifications and characteristics, and used in accordance with a mandatory code of practice. This would ensure that virtual fencing devices that are not produced with best practice safety mechanisms and design, are not legal. A mandatory code of practice for users would ensure that only careful and proper use of the devices is permitted by law.

The proposed amendment seeks to provide exemption for use of virtual fencing in all stock animals. The definition of stock animal in section 4 of POCTAA is broad and includes cattle, horses, sheep, goats, deer, pigs, poultry. Most of the research undertaken on virtual fencing is for its use on cattle, with less research available on sheep and a very limited evidence base in goats. The studies that exist in sheep do not provide confidence that the challenges related to VF are sufficiently mitigated in this species. There is no evidence available in any of the other stock species which this amendment would capture.

A literature review of virtual fencing scientific research, international standards and policies, and existing industry standards and practices[9] concluded that the animal welfare implications of VF can vary depending on many factors, including species. The authors assess that the overall risk to welfare associated with animals not learning how to interact with the technology as 'high' for cattle and 'very high' for sheep. They also note that "processes and associated animal welfare safeguards [to do with VF] are much more advanced for cattle than for sheep or other animals"; and "the strong flight response of horses to threatening stimuli would appear to pose additional challenges to the successful deployment of VF, compared with livestock species such as cattle."

Consequently, the risks to animal welfare vary between species and it is not appropriate for the bill to attempt to permit use of this technology on animal species where the risk is high or unknown.

The bill proposes that at s16(1)(a) that a definition of virtual fencing includes “collars capable of delivering electric pulses and cues”. The word audio is required to clarify what kind of cue they are capable of delivering as, without this, the phrase reads as if the cues are electric.

Summary:

RSPCA NSW considers the available scientific evidence indicates that there are significant livestock welfare risks associated with the use of virtual fencing. Species and technology specific mandatory codes of practice are required, in advance of legislative amendment, addressing the range of welfare implications of this technology.

If a decision is taken to permit VF to be used notwithstanding the above, then a minimum period of statutory review (12-18months) should be legislated to avoid poor animal welfare outcomes for stock in NSW.

[9] Ibid.