***Application***

Agri-veterinary practice has to advance, with substantial on-going research activity seeking to understand changes needed to meet existing, and emerging challenges and opportunities. However, not explicitly considering how research outcomes are practically integrated into daily farming risks research outputs failing to deliver their potential, perpetuating the research – implementation gap.

***Introduction***

Considerable resources are invested in research activities annually, however, rarely is research tied specifically to an implementation plan. In the case of influencing change in the care of farmed livestock, both farmers and their veterinary surgeons need to understand the need for change, what the new practice should be and how to implement it (Michie, van Stralen and West, 2011). However, many examples exist within the sheep industry where previous research has highlighted specific issues and proposed solutions, yet these issues still cause major concerns.

As part of a wider project on medicine stewardship in sheep in Northern Ireland (NI) we sought to identify if specific examples of the research – implementation gap existed, in the context of the lived experience of NI sheep farmers and vets. We ultimately aim to avoid past failures in translating research into change through reflecting on where this has previously happened.

***Materials and Methods***

Utilizing mixed research methods, a literature review, scoping questionnaire and semi-structured interviews (n=27 farmers; n=15 vets) were followed by discussion groups (n=13 farmers; n=2 vets). These sought participants’ views on, and experiences of, medicine use in the NI sheep flock. Participants were sheep farmers and farm animal veterinary practitioners working in NI.

The interviews and discussion groups were electronically recorded and transcribed, or contemporaneous notes were made when permission for recording was not obtained. Transcripts and notes were re-read, coded inductively and exemplar quotations identified.

***Results***

The review of extant literature and the findings of 122 questionnaires revealed four main foci which were then considered in light of farmer and vet beliefs and behaviours for further targeted action: (i) control of infectious lameness; (ii) administration of oral antibiotics to neonatal lambs; (iii) prevention of abortion due to *Chlamydia abortus;* (iv) and sheep scab control.

Lameness was identified by farmers and vets as the main driver for antibiotic use in sheep flocks, reflecting findings elsewhere. Vaccination to prevent footrot was reported by 21% of survey participants. Farmers and vets expressed that better lameness management was something they wished to achieve. However, awareness of the 5-point-plan (Clements and Stoye, 2014) among farmers was low and little evidence was seen or reported of a co-ordinated, multi-factorial response to manage lameness, despite evidence in the literature going back some 50 years on the key action points needed to minimise infectious lameness (Abbott, 2000).

Farmers participating in this study recognised that routine oral antibiotic administration was something they would like to avoid, but some found it inevitable that at some point during lambing they would administer antibiotics. Others freely admitted not knowing why they undertook the practice at all. Some farmers and vets expressed apprehension about lambing seasons in the future without such products, despite the long-standing evidence of the efficacy of colostrum (Hodgson *et al.,* 1992). Farmer frustration at being unable to source oral antibiotics was reported, alongside vets selling alternative antibiotics for oral administration. This frustrated vets who were promoting better hygiene and colostrum management for watery mouth prevention.

Use of a vaccine, which has been available in various iterations for 60 years, (Entrican *et al.,* 2012), to prevent enzootic abortion of ewes (EAE) was reported by 48% of questionnaire participants. Vets reported how, through concerted effort, they could persuade farmers to stop using injectable antibiotics for prevention of EAE, however, these efforts were impeded by vaccine availability issues, farmers’ unpreparedness, and other vets who were willing to supply prophylactic parenteral antibiotics for abortion prevention.

When addressing sheep scab, farmers highlighted the following: a lack of understanding of disease control, which has been a problem for decades (Spence, 1951); a strained relationship with the state authorities which hindered reporting and seeking help; and an inability to obtain the necessary certificate to purchase and administer organophosphate dip. Hopelessness in the face of neighbours who refused to control scab in their flocks was also described.

***Conclusions***

Key evidence-based recommendations to address these foci have been available for decades; yet these four areas still present concern for flock-keepers today. Reasons for failure to adopt research outputs could be considered under existing models of behavioural change including failure of knowledge exchange; a feeling of, or actual inability to deliver change; as well as external restrictions on farmer behaviour. Therefore, consideration needs to be given to how change can be brought about in addition to what needs to change. This discussion must be centrally focused on the end user: the farmer.

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