Takeaways from workshop 3: Animal health

Guests attending workshop:

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In recent years, the animal agriculture sector has made significant strides to reduce antimicrobial use.

This change has been driven by a 2015 statement from the New Zealand Veterinary Association (NZVA), in addition to increasing ownership and buy-in across the profession, generational change among vets, SPCA certification, and supermarket/consumer demand.

Examples of success include:

- A recent project to reduce antibiotic use by 30% at the farm level in the lower South Island.
- Vets and dairy farmers are successfully shifting from blanket dry cow therapy prophylactic antibiotic treatment, to a selective process that only treats active infection; additionally, there is increased use of internal teat sealants (where possible).
- Shifted away from prophylactic antimicrobial use in spaying/neutering procedures for companion animals.
- Poultry industry have reduced prophylactic bacitracin use by 30-40% over the last two years, shifting to better husbandry and IPC technology.
    - But more work still needed e.g. in the EU, bacitracin is banned.

Brief stock-take of industries:

- We are doing well internationally in the pasture-based (cattle, sheep, deer) industries.
- For poultry, we are rapidly catching up to international best practice – look to Canada for a good example.
- For pigs, we haven't made as much progress towards best practice but our industry is small – look to Nordic countries for a good example.
- Although we currently do relatively well compared to other countries, others are catching up rapidly.

A robust nationwide AMU/AMR surveillance system is needed

- We currently capture sales data at a very high level, but don't understand how antimicrobials are distributed across the animal population once they are sold from wholesalers.
    - We struggle to separate out by species or indication or route of administration.
    - A few veterinary clinics have developed comprehensive bespoke antimicrobial use (AMU) data analytics for their clients.
    - The only national AMU data is via a national animal welfare programme for dairy cattle which has been collecting AMU data for six years.
- Data sales can be misleading: sales fluctuate as people buy in bulk, and around 15% of zinc bacitracin and a significant proportion of macrolides sales reported in New Zealand sales data are exported.
- Surveillance of animals is ad hoc and practically non-existent with regard to a national level surveillance programme for AMR and farmers don't always report when they have sick animals. We have low prevalence of disease but don't collect data to demonstrate this.
- Wildlife (e.g. hedgehogs with MRSA) and companion animal AMR surveillance should also be considered.

We need a central, real-time database to track transmission pathways

- We fail to identify transmission routes due to fragmented data and difficulty of connecting animal, environmental and human isolates – we need a central, real-time database.
- Confidentiality of human isolates means that metadata is difficult to access.
- Permission from farms/owners is needed for animal and food isolates.
- The National Microbiological Database houses food isolates but reporting through this database is often delayed by years.
- Some data from farmers is held in various databases (e.g. LIC) but there is no connectivity and the collective data is impossible to access.
- Current efforts to link isolates from different source often relies on relationships and individuals' goodwill.
- The cost of whole genome sequencing-based surveillance may be prohibitive.

Integrated 'one health' public health units could be another approach

- We could have a regional pilot to test this idea – look to work in the Manawatū around surveillance of animal, food, environment to track outbreak.

The research landscape is fragmented

- Research on AMR in New Zealand is often ad hoc
- There are missed opportunities to value-add e.g. recent quantitative microbial risk assessment survey could have had AMR component

Barriers hinder alternative approaches to antimicrobial treatment

- The New Zealand veterinary medicines and ag compounds regulatory system is reluctant to accept international evidence for new products, with trials in-country required prior to approval.
- But the New Zealand market is relatively small, so it is difficult to persuade companies to conduct trials here.
- An example is the strep vaccine for mastitis in dairy cows that has lots of international data but is not yet available here, pending an expensive and extensive New Zealand field trial.
- This applies not just to pharmaceutical products, but also chemical products such as disinfectants.
- The limited access to alternatives like disinfectants in turn limits the types of IPC, husbandry and hygiene that can be practiced.
- For the deer industry, there are very few good vaccines or pharmaceutical products because of the small market. Often have to resort to using off-label treatments, and it's almost always metaphylaxis.

Vaccines and other IPC approaches are under-used

- Biosecurity is not just at the border – it needs to happen on-farm too.
- When vaccines are correctly administered, they are very (>80%) effective.
    - We need to train farmers to administrate correctly.
    - Vaccines available for salmonella, clostridium, campylobacter, leptospirosis (for example).
- There is poor uptake of the salmonella vaccine (~20%).
    - This vaccine causes a temporary dip in milk production that may deter some farmers.
    - Also may choose not to get vaccines for cost reasons.
    - Complacency sets in when outbreaks don't occur. But cost-benefit shows that vaccination is worth it even if outbreaks only occur once every 20 years.
- There are two oral vaccines for Eimeria in poultry available; the technologies for vaccine administration in New Zealand could be improved e.g. overseas vaccines are administered to eggs.
- The small profit margin for vaccine development does not make this attractive to industry; researchers don't have the resourcing to progress vaccine development.
- It's tricky to get good data on vaccine efficacy – which is important if we're proposing vaccines in lieu of antimicrobials.

- Husbandry and hygiene may be easier and more immediate ways to effect change: the mentality of managing health by routine, rather than a once-per-year injection, gets people to do the job better.
- Some of the diseases we vaccinate for in animals are zoonotic – vaccination protects people, but this is often not factored into decision to vaccinate animals.

Science communication and social science are key to behaviour change

- Some vets are working with social scientists on a participatory development process that empowers farmers to come up with and implement ideas. This ownership instils a sense of pride.
- NZVA's traffic light system has been effective but has also had unintended consequence of people not using 'red' antimicrobials.
    - Shifting message to "if it's right, reach for red" and IPC first and foremost
- Comms needed around vaccines and husbandry