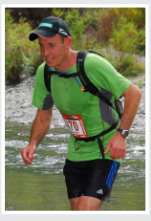
Sheep & Beef Research Review™

Making Education Easy

Issue 9 – 2017

In this issue:

Independent commentary by Andrew Roe



Andrew has worked in a Southland mixed practice for over 25 years. With sheep, beef and deer being the predominant farming types when he moved to the region, he has considerable experience in these areas and, even though dairy cattle work now takes up a large part of this time, he is fortunate enough to still have a reasonable number of sheep clients in his practice area. **FOR FULL BIO CLICK HERE**

Welcome to the ninth issue of Sheep and Beef Research Review.

The main themes in this issue are antimicrobial use and resistance, veterinary parasitology, and neurology in food-producing animals. Also included are papers dealing with gangrenous mastitis in ewes, homeopathy efficacy in livestock, and the risks of injection-site lesions in cattle.

We hope that the research featured in this issue is helpful and applicable in your daily practice. We look forward to receiving your comments and feedback.

Kind regards

Andrew Roe

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NEW ZEALAND VETERINARY JOURNAL (NZVJ): ANTIMICROBIAL RESISTANCE

There is general agreement amongst the world's scientists that antimicrobial resistance (AMR) is one of the greatest global threats of the 21st century. With at least 700,000 people dying from drug-resistant infections each year, Dr Margaret Chan, Director-General of the WHO, says "Antimicrobial resistance poses a fundamental threat to human health, development and security."

Here in NZ, our own veterinary association has shown bold leadership, developing its aspirational goal that, by 2030, our nation will not need antimicrobials for the maintenance of our animals' health and wellness. To help reach this goal, the NZVA established the Antimicrobial Resistance Leadership Group as well as compiling a range of resources and guidelines for its members (see: www.nzva.org.nz/page/amr).

In line with this strategy, the *NZVJ* has done its bit to ensure readers are up to date with current recommendations and trends in antimicrobial usage and with AMR issues in general. The February issue of the journal was dedicated to this field and included a range of scientific articles and guest editorials on the subject. While I believe that all the articles are well worth reading, I have selected the following four as being of the most interest to those of us involved in sheep and beef practice:

Antimicrobial resistance: a global threat with remarkable geographical differences

Author: Guardabassi L

Summary/comment: Bacteria had a massive head start, having evolved strategies to survive the effects of antimicrobials long, long before us humans ever started using them. So, the more pessimistic amongst us may readily concede that we are fighting a losing battle. However, this guest editorial by Luca Guardabassi of the Ross University School of Veterinary Medicine offers some hope. The article, largely a scene-setting commentary for the rest of the publication, outlines the vast differences in the prevalence of AMR amongst the European countries. Clearly different historical patterns of antimicrobial usage (both in humans and animals) have led to hugely different levels of AMR. So, while it is inevitable that AMR will continue to increase, it is heartening to have it confirmed that the rate at which it does so can be significantly influenced by the usage strategies we adopt going forward.

Reference: N Z Vet J. 2017;65(2):57–59

Abstract

One health future to meet the AMR challenge?

Authors: Priest P et al.

Summary/comment: One of the key objectives of the NZVA's strategy to raise our profile and perceived value in society has been to create awareness of the fact that vets are in a unique position, sitting at the interface between humans, animals and the environment. As such, we are ideally suited to adopt a One Health approach to investigating, and attempting to find solutions for, many of today's daunting global challenges.
AMR is undoubtedly one such challenge and the authors of this editorial make a strong case for using a One Health approach to tackling it. After an insightful summary of the current thinking around the importance of human-animal-environment interactions with regard to AMR development, the authors put forward a well-supported argument for the need for NZ's political, epidemiological, medical, and veterinary factions to work together to develop a clear strategy around antimicrobial usage and AMR surveillance. And a glance at the list of the authors' names will show that they practice what they preach; the editorial itself was a joint effort by researchers from both the human and animals fields, with Massey's EpiLab and Otago University's Departments of Pathology and Preventive and Social Medicine all represented.

Reference: N Z Vet J. 2017;65(2):60–61
Abstract

Multidrug resistant Enterobacteriaceae in New Zealand: a current perspective

Authors: Toombs-Ruane LJ et al.

Summary/comment: For those interested in the "how" and "why" of AMR, this is an excellent review article by the same multi-site team that penned the One Health editorial previously described. Using Enterobacteriaceae (the group of gram-negative bacteria that include species such as *Escherichia coli* and *Klebsiella pneumoniae*), the authors outline the various mechanisms by which bacteria develop AMR and then go on to look at the likely AMR reservoirs and transmission pathways. This hammers home the importance of the One Health approach, where human, animal, and environmental factors all need to be considered together if we are to make any headway.
The article's discussion includes sections on antibiotic usage in NZ as well as recommendations on surveillance, antimicrobial stewardship, and future research needs. I found the section on antimicrobial susceptibility surveillance particularly enlightening. Denmark, one of the early adopters of the One Health approach for AMR management, is an example of how such monitoring can be used to make beneficial policy changes, leading to improved antimicrobial usage and a measurable reduction in the rate of AMR development.

Reference: N Z Vet J. 2017;65(2):62–70
Abstract

Use of antimicrobials for animals in New Zealand, and in comparison with other countries

Authors: Hillerton JE et al.

Summary/comment: NZ has agreed to adopt the World Health Organisation's global action plan to manage AMR. A key component of this plan is being able to monitor antimicrobial usage in food-producing animals. This study, by a group of NZ veterinarians with a range of backgrounds including clinical practice, industry, and epidemiology, used data such as antimicrobial sales and animal numbers to get a gauge on where we currently sit.

Given the extensive nature of much of our pastoral agriculture, as well as our relatively small pig and poultry industries, the authors would have expected NZ to score well in terms of mg of active ingredient sold per kg biomass. And, sure enough, we came in as the third lowest antimicrobial user in food animals of the thirty or so countries included. Of particular interest is the huge range the study revealed, with Italy, at the top of the list, using one hundred times the amount used in Norway, the lowest user in the study. Also worth pointing out, is that our medical counterparts are not faring as well, with antimicrobial use in humans in this country being 13 times that used in animals, which puts NZ mid table for human usage. Being the first report of its type in this country, the findings of the study will be helpful when it comes to monitoring the success of our AMR management strategies going forward.

Reference: N Z Vet J. 2017;65(2):71–77
Abstract

Achieving responsible antimicrobial use: communicating with farmers

Authors: Reyher KK et al.

Summary/comment: Continuing with the AMR theme is this timely and very helpful paper from *In Practice*. The lead author is Dr Kristen Reyher, a veterinary epidemiologist, who currently heads the AMR Force, a UK based interdisciplinary research group that focuses on AMR. As Kristen and her fellow authors (two production animal clinicians from Bristol University) point out, farmers must keep the best interests of their animals and their operations in mind, and their use of antimicrobials is closely tied to these goals. As vets, we may feel conflicted when it comes to striking a balance between optimal health of the animals currently under our care versus long-term effectiveness of available antimicrobials. Farmers are even more conflicted; their very livelihood depends on the health and productivity of their livestock. So, we can hardly blame them for a tendency to overtreat or, possibly worse still, prophylactically treat, their animals.

With increasing pressure on vets to educate farmer clients in the sustainable use of antimicrobials and to subsequently tighten our prescribing practices, it is likely that we are going to have plenty of difficult conversations with our clients. This paper offers plenty of tips and recommendations to help make this process smoother and, ultimately, more fruitful. These suggested approaches are covered under the following headings within the main body of the article, and I recommend all of us involved in production animal practice take these ideas on board:

- Improving veterinary-farmer communication
- Participatory approaches
- Accurate records of medicines use
- Benchmarking
- Active herd-health management
- Education and training
- Improving the system.

Reference: In Practice. 2017;39:63–71
Abstract

Gangrenous mastitis in a ewe flock

Author: Elton M.

Summary/comment: Gangrenous mastitis, also known as "black mastitis" by sheep farmers, occurs sporadically in NZ ewe flocks with most farms getting a few cases any time between lambing and post-weaning. The disease is a particularly frustrating one for farmers as it is almost impossible to cure (even the most diligent farmer is not likely to detect a case before the affected tissue has become non-viable) and, even if the ewe can be saved with antibiotic therapy, she will no longer be able to rear her lamb(s). However, even though the number of cases may fluctuate from year to year, losses, as a percentage of total ewe numbers in a flock, are usually pretty low.

This case, reported by North Canterbury vet, Mara Elton, is an exception, with the disease occurring in an outbreak form. Nearly 6% of a mob of ewes that were purchased with lambs at foot died several days after arrival on the buyer's farm. After outlining the nature of the outbreak and her findings, Mara presents an interesting and comprehensive overview of gangrenous mastitis in ewes, the aetiology and potential predisposing factors. She concludes with discussing the possible reasons for the atypical presentation of the condition in the case she encountered.

Reference: Proceedings of the Society of Sheep and Beef Cattle of the NZVA, pp 153-158, Jan 2016
Abstract

World association for the advancement in veterinary parasitology (WAAVP) conference 2015

Author: Bingham C.

Summary/comment: The WAAVP is a pretty big beast. When it held its conference in Liverpool in late 2015 over 750 delegates turned up. Two hundred and fifty scientific presentations were given, split over six concurrently running streams. Our man on the ground, Zoetis vet Clive Bingham, attended and, as he has done previously, provided a report on the event at our own sheep and beef conference last year. After giving an overview of the conference, Clive selected four papers that he considered to be of interest to local sheep and beef vets and presented a brief summary of each. The papers he chose were:

Parasites in a changing world: The speaker pointed out that because of the disparity in research funding between the "developed" and the "developing" world, only 1% of recently developed drugs were aimed at dealing with tropical diseases. This could well be at our peril as, due to global warming, tropical and parasitic diseases are likely to affect a greater proportion of the world's population in years to come.

One Health approach – Prevention and control of rocky mountain spotted fever in the south-western United States: At first glance it may be hard to understand why Clive considered that a bacterial disease of humans in America would be of interest to an audience of NZ vets. The reference to One Heath in the title is the giveaway. The causative organism of Rocky Mountain Spotted Fever (RMSF) is transmitted by a tick, which is carried by dogs. The study in question demonstrated how a programme aimed at preventative tick treatment of dogs, and improved methods of dog control in general, lead to a 43% reduction of RMSF cases in the human population. A brilliant example of One Health in action.

Effect of anthelmintic treatment strategies on nematode species prevalence in grazing lamb in Scotland: A nice study, carried out by the highly regarded Moredun Institute, which showed the benefits of strategic drenching of lambs as opposed to a standard whole-mob monthly drenching regimen. Three different refugia-based drenching regimens all ensured that worm species diversity was maintained over the six-year study, whereas biodiversity was lost on the block in which the monthly drenching regimen was employed for the same length of time.

Managing resistance to long-acting injectable Moixdectin in sheep nematodes though identifying relationships with the efficacy of oral Moixdectin and co-administration of an unrelated anthelmintic: This study, carried out on an Australian merino property with severe Moxidectin resistance amongst its Haemonchus population, investigated the benefit of giving a primer dose of a short-acting oral drench (Monapantel) at the same time as a long-acting Moxidectin injection. Faecal egg counts carried out over the following 112 days suggested the strategy worked very well, although the authors warned that some of the benefit may have been due to dry conditions and the resulting low pasture challenge.

Reference: Proceedings of the Society of Sheep and Beef Cattle of the NZVA, pp 59-63, Jan 2016
Abstract

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Efficacy of homeopathy in livestock according to peer-reviewed publications from 1981 to 2014

Authors: Doehring C & Sundrum A

Summary/comment: With increasing demand for meat, dairy products, and eggs that have been produced in antibiotic-free systems (both organic and non-organic operations) it is not surprising that there has been heightened interest in alternative remedies. The fact that the cautionary messages around AMR and the need for more prudent use of AMs are also gaining traction will only serve to add to this interest.

Homeopathy offers an alternative to antimicrobials and, according to an article I read recently in the farming pages of my local paper, its use in farmed livestock in NZ is growing. So, this review article from the Vet Record is quite a timely one. The authors, both from the Department of Animal Nutrition and Animal Health, University of Kassel in Germany, conducted a comprehensive literature review to assess the efficacy of homeopathy in cattle, pigs, and poultry. Spanning a window of over 30 years they confined themselves to peer-reviewed studies where the condition treated was one that normally would have been treated using antimicrobials. The individual results were mixed with just over half of the 52 studies revealing a benefit to the homeopathic remedy/regimen used compared with placebo. However, because no study was repeated under comparable conditions, the authors concluded that, as yet, there is no valid evidence to support the substitution of antimicrobials with homeopathic remedies. While the gist of the study and its findings can be readily gleaned by reading the abstract alone, I enjoyed reading the article in its entirety, largely to get a feel for the wide range of diseases and conditions for which homeopathy is being used in food-producing animals.

Reference: Vet Rec. 2016;179(24):628
Abstract

Injection-site lesion prevalence and potential risk factors in UK beef cattle

Authors: Cresswell E et al.

Summary/comment: Like many other rural practices, the practice I work for often holds field days or seminars for our farmer clients. When we ask for feedback from the audience, concerning what topics they would like us to cover at future events, I am surprised that "correct vaccination technique" pops up from time to time. Not surprised because I don't believe it is a worthwhile topic, but surprised because most of our clients have been sticking needles into animals longer than I have been a vet, so for them to acknowledge that they may need to brush up is pleasantly surprising! If our farmers are anything like UK beef farmers, then some education on injection techniques wouldn't go amiss. This study by a group of UK vets, from both academia and clinical practice, consisted of two parts;

1. Examination of beef cattle carcases at four abattoirs.
2. A questionnaire survey asking beef farmers about their vaccination/injection technique.

While the 4.1% incidence of injection site lesions (ISL) was cause for concern, (especially considering the number of lesions that were categorised as "large", i.e. ≥16cm) the farmer survey rang more alarm bells, with a high percentage of respondents clearly not following recommended injection practice with regards to basic techniques such as appropriate injection site and correct depth of injection for the product concerned (subcut vs intramuscular). As the authors point out, the potential losses of poor injection technique may well be greater than simply the costs involved with trimming the carcases. It has been hypothesised that the taste and texture of the meat around an ISL could be adversely affected. Other potential risks are also raised. The Discussion section of the paper calls for education and incentives to encourage better injection technique, thus reducing the incidence of ISL, and also outlines the progress made in this area in other beef-producing countries, particularly the US and Australia, using innovative education and incentive programmes.

Reference: Vet Rec. 2017;180(3):70
Abstract

VETERINARY CLINICS OF NORTH AMERICA (VCNA): FOOD ANIMAL PRACTICE – RUMINANT NEUROLOGY

Just like the February issue of the *NZVJ* was devoted to the theme of AMR, the March 2017 special issue of the *VCNA: Food Animal Practice* journal is entirely dedicated to the subject of food animal neurology. Neurology has never been one of my strengths, especially when it comes to dealing with individual cases, as opposed to flock or herd disorders. So, this publication, complete with a number of impressive review articles, could be my saviour!

Three very helpful and practical articles cover the examination of the neurologically-affected ruminant:

Neurologic examination of the ruminant

Authors: Fecteau G et al.
Reference: Vet Clin North Am Food Anim Pract. 2017;33(1):1–8
Abstract

Localization of neurologic lesions in ruminants

Author: Washburn KE
Reference: Vet Clin North Am Food Anim Pract. 2017;33(1):19–25
Abstract

Diagnostics and ancillary tests of neurologic dysfunction in the ruminant

Author: Nagy DW
Reference: Vet Clin North Am Food Anim Pract. 2017;33(1):9–18
Abstract

The journal then deals with specific conditions, with the following articles being of interest to NZ sheep and beef veterinarians:

Cerebral disorders of calves

Authors: Dore V & Smith G
Reference: Vet Clin North Am Food Anim Pract. 2017 Mar;33(1):27-41
Abstract

Cerebral disorders of the adult ruminant

Author: Middleton JR
Reference: Vet Clin North Am Food Anim Pract. 2017;33(1):43–57
Abstract

Cerebellar disease of ruminants

Author: Gibbons P
Reference: Vet Clin North Am Food Anim Pract. 2017;33(1):59–66
Abstract

Brainstem and cranial nerve disorders of ruminants

Authors: Boileau MJ & Gilliam J
Reference: Vet Clin North Am Food Anim Pract. 2017;33(1):67–99
Abstract

Spinal cord and peripheral nerve abnormalities of the ruminant

Author: Hartnack AK
Reference: Vet Clin North Am Food Anim Pract. 2017;33(1):101–110
Abstract

Toxicoses of the ruminant nervous system

Author: Niles GA
Reference: Vet Clin North Am Food Anim Pract. 2017;33(1):111–138
Abstract

I am not sure how many NZ vets or veterinary practices subscribe to this journal; I suspect there would not be many. But a one-off purchase of these articles or, the whole of the March 2017 issue, could well make a very worthwhile addition to your practice library.