



Sheep & Beef Research Review™

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

A major highlight of this issue is an important study by NZ researchers who have identified a method to reliably predict fertility outcomes in heifers, which will allow selection of animals with superior fertility traits. Other selections in this issue include neurological disorders in ruminants, the use of sildenafil (aka Viagra) to improve survival in lambs, optimal timing for the administration of long-acting anthelmintics, changing attitudes of vets to pain and use of analgesics in cows, and a deep-dive into the ruminant forestomach.

We hope that the selections in this issue are helpful in your practice. We welcome your comments and feedback.

Kind regards

Andrew Roe

andrewroe@animalhealthreview.co.nz

Research Review thanks MSD Animal Health for their sponsorship of this publication, and their support for ongoing education for animal health professionals.

Primary, congenital neuroaxonal dystrophy with peripheral nerve demyelination in Merino-Border Leicester × Polled Dorset lambs

Authors: Hawes MC et al.

Summary: This case report is believed to be the first report of congenital neuroaxonal dystrophy in Merino-Border Leicester × Polled Dorset lambs and the only cases in which peripheral nerve demyelination has been identified.

Comment: It is not uncommon to receive reports from sheep farmer clients involving neurological conditions in their lambs. Ranging from slight ataxia to severe hindlimb paresis, many flocks experience a few animals each year. While neuroaxonal dystrophy maybe suspected in some cases, an accurate diagnosis is not often made because only a small number of affected lambs is observed, with farmers not believing the cost of a full workup is justified. Occasionally, however, larger numbers are affected and a diagnosis is confirmed, with reports in this country of as many as 6% of a flock affected by the disorder. Seen in most of our main breeds, including Merinos, the typical presentation of neuroaxonal dystrophy is a progressive condition, with the first signs usually appearing at several months of age.

This case, investigated by a group of Australian vets, makes for interesting reading. It is unusual for a couple of reasons: the affected lambs exhibited signs right from birth and, unlike previously reported cases, the pathology was not confined to the central nervous system (demyelination of the peripheral nerves contributed to the severity of the clinical signs).

Reference: *Aust Vet J.* 2017;95(11):416–420

[Abstract](#)



Sheep & Beef Research Review

BRIEF COMMUNICATION: Does Viagra protect fetal lambs against maternal pregnancy toxoemia?

Authors: Peterson SW et al.

Summary: These researchers determined whether giving sildenafil citrate to triplet-bearing ewes in late gestation might increase lamb birth weight and also assessed its influence on the incidence of pregnancy toxoemia.

Comment: When the *Research Review* team send me the collection of sheep and beef research abstracts my first job is to go through the selections and whittle them down to the ten papers I believe to be of the most interest to NZ vets. Some I reject straight away as they do not have a lot of relevance to local vets and/or our farming systems. Others have potential and make the first cut. And with a few I immediately think, "Yes!! This one has to be included". This paper definitely fell into the latter category for its title alone! But, as it turns out, the eye-catching heading is not the only thing that this study, by researchers from Massey, AgResearch and Auckland University, has got going for it.

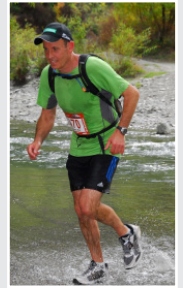
Much of the difference in birthweight and survival between singleton lambs and those born as multiples is due to differences in foetal oxygen and nutrient uptake, which in turn are a function of placental blood flow. Multiple foetuses typically have smaller placentae and smaller cotyledons than their singleton counterparts, especially in late pregnancy when foetal demands are at their highest. Sildenafil citrate, the active ingredient of Viagra, causes vasodilation and had already been demonstrated to lift birth weights in rats and singleton lambs. So, it made sense to check its effects on lambs born as multiples; triplets in this particular case. The results, in terms of lamb survival, are dramatic, with birth weight and gestation length also affected by the treatment. Several potential mechanisms for the responses to treatment are discussed, with the authors agreeing that further research is required to check out these theories. In the meantime, I am sure you will be having the same thought as me... as Viagra appears to work so well on the ewes, is it not time to see what it can do for the rams?

Reference: *Proceedings of the New Zealand Society of Animal Production* 2016; 76: 172-174

[Abstract](#)

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.



Being a founding director and former shareholder of VetSouth he has experience in practice management and governance, as well as being involved in the industry at a national level where he is currently a member of the executive of the sheep and beef cattle special interest branch of the NZ Veterinary Association, is on the panel of NZVA's Red Meat Veterinary Strategy Group as well as representing the interests of sheep, beef and deer vets on NZVA's Standards Committee.

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Sheep & Beef Research Review

Neurological disease in ruminants

Authors: Mueller K

Summary: This editorial article discusses the importance of recognising, understanding, and addressing neurological disease in cows and sheep from a whole herd/flock point of view.

Comment: Continuing with the neurological theme are the following two offerings from the October 2017 issue of the Vet Record. The first is an editorial by Karin Mueller of Liverpool University, which introduces the second article, a retrospective study of neurological cases over a 10-year period.

Dr Mueller's article is a good refresher on the approach to dealing with neurological cases in cattle and sheep, both from an individual sick animal viewpoint, as well as from a herd/flock perspective. Being an editorial article, it does not go into a lot of depth but, nonetheless, offers a number of valuable insights and tips on investigating neurological disorders. Emphasis is made on the role that metabolic conditions can play in the impairment of neurological function, for example. And not just the obvious suspects, such as hypocalcaemia and hypomagnesaemia, but also those conditions commonly affecting young stock, including neonatal calves and lambs. The author also stresses the importance of noting any neurological signs displayed by a proportion of animals affected by diseases where the predominant clinical signs may involve other organ systems. Examples given include *Histophilus somni* and (topically, from a NZ perspective) *Mycoplasma bovis*.

By highlighting the appearance of conditions relatively new to the UK, including those resulting from changes in climate such as ryegrass staggers and Lyme borreliosis, Dr Mueller urges us to periodically review and revise our neurology work-up to maintain a sound approach.

Reference: *Vet Rec.* 2017;181(14):368–369

[Abstract](#)

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Ruminant neurological disease: a retrospective cohort study

Authors: Giles L et al.

Summary: This retrospective study evaluated the accuracy of neurological disease diagnoses in a cohort of ruminants with neurological signs that were donated to a UK production animal research centre.

Comment: This paper, authored largely by vets based at Glasgow University's veterinary school, describes a detailed retrospective study involving 96 ruminants displaying neurological signs, that were donated to the university's "Scottish Centre for Production Animal Health and Food Safety" (SCPAHFS). The motivation for the study was a concern over the high proportion of neurological conditions, investigated by Britain's veterinary labs, for which a diagnosis was not reached; nearly 80% for cattle and 35% for sheep. These statistics are particularly alarming when you consider that neurological conditions in ruminants can be indicators of toxicity and zoonoses, as well as being associated with pain and distress.

Included in the study were all live sheep and cattle donated to the SCPAHFS by first-opinions vets where a neurological condition was the main presenting sign on clinical exam. They represented 5.4% of all animals donated to the SCPAHFS over the ten-year period in question. The key findings of the study, including the range of presenting conditions for each species, as well as the list of diagnoses found, are discussed. It is acknowledged that, being a referral centre, the distribution of the various diagnoses is unlikely to represent that seen in the field, as conditions that are easy to diagnose were unlikely to be sent to the centre. All the same, the range and frequency of disorders was interesting. For example, the most common diagnosis in the sheep examined was vertebral osteomyelitis. As this is believed to be largely the result of post-tailing infections, it could also be more common in this country than we realise.

What was particularly enlightening was that fact that, of the 96 live animals submitted to the centre, a definitive diagnosis was made for 84% of them ... much higher than the success rate for those cases investigated by the veterinary labs using samples taken by vets in the field. Also of note was that, of those cases where the definitive diagnosis was reached by post mortem exam, 38% of the diagnoses contradicted the diagnosis made by clinical exam. This statistic alone highlights the benefit that can be gained by carrying out autopsies with or without additional laboratory tests when dealing with neurological disease in ruminants.

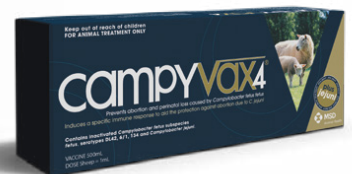
Reference: *Vet Rec.* 2017;181(14):372–373

[Abstract](#)

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Engaging veterinarians and farmers in eradicating bovine viral diarrhoea: a systematic review of economic impact

Authors: Yarnall MJ & Thrusfield MV

Summary: This systematic review of the literature was conducted to determine the financial cost of bovine viral diarrhoea (BVD).

Comment: Over the last ten years NZ vets have come a long way in raising the awareness of the impact of BVD and in implementing management strategies on our clients' properties, both dairy and beef. Much of the credit for this progress has to go to the BVD steering committee which, since its inception in 2005, has assisted vets, farmers, and other industry stakeholders through the creation of excellent resources including the website (www.controlbvd.org.nz), the BVD Management Toolkit, and a number of seminars and workshops. Not surprisingly, after the progress made so far, the steering committee, and the industry in general, has reached the point where the big question is now being seriously asked: Is it feasible to attempt to eradicate BVD from this country?

This paper, by industry and university veterinarians from the UK, addresses that very issue. Acknowledging that the best way to engage farmers and vets in considering BVD eradication is to highlight the cost of the disease, the authors have conducted an exhaustive review of research around the world, filtering all research on BVD published between 1991 and 2015 and ending up with 31 papers whose primary focus was evaluating the economic impact of BVD eradication. As expected, there is quite a range (£0 to £552 per cow per year, once outliers were removed). What I found most interesting was the robust discussion around this variation, with some of the reasons for the difference being explained. The economic benefit of eradication is a combination of the elimination of the losses associated with the disease and a reduction in the cost in control measures. One incentive for many farmers involved in national BVD eradication schemes is the hope that they can stop vaccinating. While some countries have achieved eradication without vaccination, advances in cost-effective diagnostic testing mean that maintenance of biosecurity through vaccination is an option, as seen in Germany, Ireland, and Scotland. This is just one explanation for the range in economic impact reported by the various studies included.

Interestingly, recent estimates suggest that BVD is responsible for losses of around \$220/cow in infected dairy herds in NZ. Add to this the savings that could be made in BVD control if the virus was eradicated, and we would sit somewhere near the middle of the range reported in this study.

Reference: *Vet Rec.* 2017;181(13):347

[Abstract](#)

Clinicians' attitudes to pain and the use of analgesia in cattle

Authors: Reader J

Summary: This editorial discusses the use of analgesic drugs in cattle in multiple indications and also provides some recommendations for analgesic therapy.

Comment: This editorial review article by Dorset vet John Reader offers a timely perspective for NZ production animal vets, in view of the recent changes to our Animal Welfare Act and the raft of new regulations, the first batch of which will come into force next year.

After introducing a related article in the same issue of the *Vet Record* (see below) Dr Reader summarises the findings from a range of studies looking at the use and benefits of analgesic products in various aspects of cattle medicine and husbandry, including several papers from kiwi researchers. The following topics are covered:

- Disbudding and dehorning pain relief; including a discussion on the welfare benefits of sedation as well as post treatment analgesia.
- Post calving pain relief.
- Cattle lameness, including the use of NSAIDs to alleviate, not only the pain associated with the underlying condition, but also any pain induced by the corrective procedures undertaken.
- Use of analgesic/anti-pyretic drugs, rather than anti-microbials, as the first up treatment in certain diseases.

The author concludes the paper with the following recommendations, essentially a summary of the main elements of the paper:

- Revise all protocols for the use of analgesics on farm animals.
- Follow BVA/BCVA guidelines for routine calf procedures. Use local anaesthetic and NSAIDs for all castration and disbudding of calves.
- Do not prejudge a farmer's response to the additional cost of pain relief.
- Give planned pre-emptive pain relief wherever possible (at morning feeding).
- Consider the use of NSAIDs to replace antibiotics.
- Consider the use of sedation for routine procedures.

I believe the third point is particularly insightful, and a principle that has relevance to many of our client interactions, far beyond discussions around pain relief.

Reference: *Vet Rec.* 2017;181(15):397–399

[Abstract](#)

Clinician attitudes to pain and use of analgesia in cattle: where are we 10 years on?

Authors: Remnant JG et al.

Summary: This paper presents the findings of a questionnaire sent to UK cattle practitioners asking them to score pain severity for several conditions of cattle and routine procedures in calves and asking about their attitudes towards the use of analgesic agents.

Comment: In 2006, UK cattle practitioners were surveyed about their attitudes around pain and pain relief in cattle. Participants were asked to give a pain score for a range of diseases, conditions, and animal husbandry procedures. They were also asked a range of questions regarding their opinions and current usage patterns of analgesic products in cattle. A similar project was carried out in NZ, which yielded similar findings.

The authors of the current paper, researchers from the veterinary school at Nottingham University, decided to repeat the survey recently, to get a gauge on current attitudes about pain relief in cattle and compare the responses to those received ten years previously. When it comes to the pain score, a similar range of scores was given for each of the conditions or procedures listed as was given in the 2006 version, but, what is interesting however, is that the average score awarded had risen for about half of the conditions, reflecting an increase in practitioners' perception of pain over the ten years between the two surveys. Similar changes in attitude were observed in other areas such as the acceptable cost of pain relief, the use of analgesia, and opinions about the respondents' knowledge of pain and pain relief options. One area of concern, however, was a mismatch between perceived severity of pain in routine calf procedures, such as disbudding and castration, and the frequency of analgesic use (at least in terms of NSAIDs), an area which, according to the authors, clearly warrants further work. While I acknowledge that the survey was undertaken in the UK and not NZ, I believe the full report is well worth a read, with the concepts discussed and the trends observed being very relevant to production animal practice in this country.

Reference: *Vet Rec.* 2017 Oct 14;181(15):400

[Abstract](#)



Sheep & Beef Research Review

Digestive disorders of the ruminant forestomach

Editors: Callan RJ & Jones ML

Summary: This issue of the *Veterinary Clinics of North America: Food Animal Practice* features articles on the ruminant stomach, including structure and function, diagnosis and/or treatment of various disorders, and the rumen microbiome.

Comment: I have mentioned this journal, the *Veterinary Clinics of North America* (the food animal section), in previous issues of *Research Review*. Each edition of this quarterly publication focuses on a specific topic and offers a range of relevant, usually very practical papers around that topic. Previous editions I have introduced have covered neurological conditions of production animals and lameness in cattle. This one, the November edition, is entitled *Digestive Disorders of the Forestomach*, but actually is a lot broader than that, with good reviews and refreshers on topics such as rumen function, rumen development, and the role of probiotics and fermentation additives.

A full list of the contents follows:

- Digestive disorders of the ruminant forestomach.
- Rumen function and development.
- Diagnostic approach to forestomach diseases.
- Diagnosis and treatment of clinical rumen acidosis.
- Disorders of rumen distension and dysmotility.
- Diagnosis and treatment of hardware disease.
- Temporary rumenostomy for the treatment of forestomach diseases and enteral nutrition.
- Rumen microbiome, probiotics, and fermentation additives.

Reference: *Vet Clin North Am Food Anim Pract.* 2017;33(3):427–554.

[Abstract](#)

A field trial to compare the response to drench capsules given to high country, Romdale, 2-tooth ewes either pre-tup or pre-lamb

Authors: Robertson D

Summary: This NZ study evaluated the benefits of administering long-acting anthelmintics before tupping versus before lambing.

Comment: Ever since long-acting anthelmintic controlled-release capsules (CRCs) were first introduced onto the NZ market, nearly 30 years ago, the accepted timing of treatment (in adult ewes, at least) has always been in the spring. And there is good reason for this. The periparturient rise in ewe faecal egg counts is a well-recognised phenomenon, whereby the stresses of late pregnancy and early lactation can compromise a ewe's immune system capabilities, leading to an increased susceptibility to the effects of internal parasitism. Elimination of an existing worm burden and prevention of a new one developing can lead to heavier ewes and lambs at weaning and reduced worm larval exposure as the season progresses.

This neat study by Dave Robertson of the Veterinary Centre, Oamaru, challenges this approach, pointing out that, in certain circumstances, you may get a better bang for your buck by using CRCs in your ewe flock at a different time of year. The study was conducted on a large, extensive, summer-dry inland Otago property where feed over tupping is typically more sparse, and of poorer quality, than the abundant crops fed to the ewes over winter and early spring. So, it was postulated that maybe the CRCs would return a greater benefit if inserted before tupping rather than before lambing. A field trial was set up to test this hypothesis, with very startling results. The main take-home message from this study is that tailoring the use of long-acting anthelmintic products to the specific features of the farm in question can result in a better return on investment and more sustainable use.

Reference: *Proceedings of the Society of Sheep and Beef Cattle of the NZVA*, pp 29-33, Jan 2017

[Abstract](#)

Antral follicle count of New Zealand registered angus heifer ovaries and the correlation with fertility outcomes

Authors: Sanderson N et al.

Summary: These NZ researchers attempted to identify an early indicator of reproductive performance in beef cows.

Comment: This ground-breaking study was largely borne out of frustration over the fact that reproductive performance in this country's beef herd has not undergone any improvement over the past thirty years. The authors, Neil Sanderson of Advanced Genetics Ltd, and members of the team from the Veterinary Centre, Oamaru, explain how previous research has shown that the earlier a heifer comes into oestrus and conceives, as a rising two-year-old, the better are her chances of continuing to get in calf early in subsequent years and the less likely she is to be culled in the future for failing to become pregnant.

Taking this a step further the authors point out that, if we can reliably predict fertility outcomes, namely if and when a heifer conceives relative to the start of mating, this will allow selection of animals with superior fertility traits prior to joining or breeding. Accordingly, the project concerns itself with this quest to identify an early indicator of reproductive performance in beef cows. And, by firstly developing a technique to count the number of antral follicles on a heifer's ovary, and then looking for a link between the number of these follicles and how early the heifer gets in calf, the jackpot was struck! The findings of this study have the potential to offer a significant step forward for the profitability of our beef farmers, and the paper deservedly won "Best Overall Paper" at this year's conference.

Reference: *Proceedings of the Society of Sheep and Beef Cattle of the NZVA*, pp 49-54, Jan 2017

[Abstract](#)

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