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to read previous issues of  
Sheep and Beef Research Review

**Independent commentary  
by Andrew Roe.** Andrew has  
worked in a Southland mixed  
practice for over 25 years.

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## Welcome to the eighth issue of Sheep and Beef Research Review.

The ovines have flocked to this issue with five papers reporting research into foetal loss in ewes, skeletal deformities in lambs, use of bioactive forages as a lamb worming treatment, whether to select for resistance or resilience in sheep, and a campylobacter abortion outbreak in sheep. A secondary theme is anaesthesia with two papers that ponder the advantages and disadvantages of different types of anaesthesia in ruminants.

We hope that there is something thought-provoking for you in this issue. As always, we look forward to receiving your comments and feedback.

Kind regards

**Andrew Roe**

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

## Investigation of fetal loss in ewe lambs in relation to liveweight changes and progesterone concentrations in early to mid gestation

**Authors:** Ridler AL et al.

**Summary:** This study investigated associations between changes in liveweight and foetal loss in ewe lambs and determined whether foetal loss was associated with plasma progesterone concentrations in early and mid-gestation. Ewe lambs with foetal loss had a marked reduction in conceptus-free liveweight leading up to the foetal loss versus those that maintained pregnancy. Plasma concentrations of progesterone did not appear to influence foetal loss.

**Comment:** Mid-pregnancy foetal loss in maiden ewes, particularly hoggets, continues to be a widespread problem in NZ, frustrating and baffling farmers and veterinarians alike. We have previously included papers on the syndrome in *Sheep and Beef Research Review* (Issues [3](#) and [4](#)). This study, by Anne Ridler and her Massey team, investigates the possibility of foetal loss being linked to either loss of body weight or fall in progesterone levels. Other researchers, here and overseas, have looked for a link with changes in body weight, both increases and decreases. The results have been mixed with no repeatable pattern being identified.

Where this study differs from previous ones, however, is that ewe live weight and pregnancy status were measured on multiple occasions, rather than simply calculating body weight change for a specific, predetermined period (e.g. between conception and scanning). By adopting this approach, Anne et al. discovered a strong association, finding that those hoggets that underwent foetal loss were more likely to have lost weight (as calculated by their estimated "conceptus free live weight") in the three- to four-week period prior to when the foetal loss was identified. Being true scientists, though, the authors pointed out that, while an association was shown to exist, the study does not prove that the loss of the pregnancy was actually caused by the weight loss. Further work is required to check for a causal relationship.

**Reference:** *New Zealand Veterinary Journal*. 2017;65(1):34-38

[Abstract](#)



### Skeletal deformities associated with nutritional congenital rickets in newborn lambs

Author: Dittmer KE et al.

Summary: This case history report describes a group of 545 pregnant rising 2-year-old Coopdale ewes on a Southland sheep farm that were grazed over winter on a fodder beet (Beta vulgaris) crop. Subsequently, 45 of approximately 750 lambs were born with a variety of skeletal deformities. The gross and histopathological lesions were consistent with a diagnosis of rickets. Analysis of the fodder beet crop revealed that it contained a low percentage of phosphorus.

Comment: This case study, co-authored by Keren Dittmer of Massey and the two investigating Northern Southland vets, Rebecca Morley and Rochelle Smith, was presented as a Clinical Communication in the NZVJ and is a timely warning to farmers and vets about the dangers of feeding unbalanced diets to pregnant or immature livestock.

Fodder beet continues to gain popularity as a winter feed for capital stock, particularly in cattle, but its use in sheep and deer is also growing, especially in the lower South Island. Its shortcomings, including low crude protein and phosphorus levels, are well documented, with advice on how to mitigate these, widely available. When it comes to pregnant ewes, problems are largely avoided due to the fact that most mobs only spend a short time (typically around six weeks or less) on the crop. However, the ewes referred to in this excellent case study spent the whole winter (3 months) on a diet of fodder beet alone, with disastrous consequences! The report also describes the effect of a similar feeding regimen on two tooth ewes, which grazed fodder beet the previous winter as hoggets.

Reference: New Zealand Veterinary Journal. 2017; 65(1):51-55

Abstract

### Targeted use of bioactive forages as a treatment for lambs

Authors: McNulty R et al.

Summary: In this 2- year study, a production-based targeted selective treatment (TST) system was used to identify individual lambs that were parasitized and subsequently grazed on bioactive forages (chicory, plantain, white clover) to evaluate a chemical-free method of control.

Comment: Ever since I graduated I can recall that researchers, both in New Zealand and overseas, evaluating various forage plants for their anthelmintic properties. A number have been identified but their usefulness has been fairly limited either due to poor palatability or the impracticalities of maintaining them in a pasture sward under conventional pasture management practices.

This two-year study, undertaken by Lincoln University scientists, and presented at the 2016 Society of Sheep and Beef Cattle Veterinarians conference, took a fresh approach to the use of bioactive forages. Rather than widely distributing the forage species across all of the lamb finishing pastures on the farm, a dedicated "hospital paddock" was developed, the pasture of which consisted of chicory, plantain, and red clover. Lambs were initially set stocked on conventional pasture that had been seeded with Trichostrongylus spp. larvae and a TST system was adopted. This involved weighing the lambs every two weeks, with any individuals not reaching their target liveweight being moved to the hospital paddock for a period of time. As each of the two study mobs contained a number of lambs that were drenched regularly with standard anthelmintics, the performance of the TST system (with respect to lamb growth rates and time taken to reach target slaughter weights) could be compared with that of conventional parasite control methods.

While the TST lambs grew slower than the drenched lambs, especially over the second half of the season, they still reached their slaughter weights in an acceptable time frame, indicating that this approach has potential in an organic farming operation as well as providing another option for any farmers looking to reduce their dependence on anthelmintics.

Reference: Proceedings of the Society of Sheep and Beef Cattle of the New Zealand Veterinary Association, pp 79-88, Jan 2016

Abstract

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## Sheep & Beef Research Review

### Resistance versus resilience: A solvable dilemma?

**Authors:** Greer A et al.

**Summary:** In this study, the timing of immune development, as assessed by faecal egg counts (FEC), in lines of Romney sheep that had been selected for either resistance or resilience to gastrointestinal parasites was compared. The results showed that physiological age, rather than chronological age, should be considered when comparing the immune competence of animals to ensure they are at a similar stage of development.

**Comment:** Continuing the internal parasite theme, this is another paper that the Lincoln team delivered at the 2016 conference. Like many other production animal vets, I have attended a number of gatherings, ranging from on-farm workshops to large conferences, where the resistance versus resilience debate has been played out. What is preferable: selecting for animals that develop strong immunity to worms at a fairly early age and so excrete very few worm eggs onto the pasture, or animals that may have a sizeable worm burden but continue to perform well in spite of it? Instinctively, most people would opt for the former and prefer to breed parasite-resistant animals. However, it is recognized that such resistance often comes at a cost; the more energy and protein that lambs partition into fighting worms, the less they can direct towards growth.

This interesting study looks for a way around that dilemma. Observing that lines of sheep that have been selected for parasite resistance for a number of generations have ended up smaller than non-selected lines, the authors postulated that maybe our selection method is the problem. Stud breeders looking to identify those sire lines with strongest parasite resistance tend to follow a set protocol, collecting faecal samples from the progeny at a specific age. But what if, rather than sampling the lambs at a specific *chronological* age, it is done at a pre-determined *physiological* age? In other words, carrying out the faecal sampling when the animals reach a specific percentage of their predicted mature body weight. This enlightening paper makes very interesting reading and, if the findings are taken on board, they could well change the way we assess the immune competence of our sheep and, maybe, other livestock.

**Reference:** *Proceedings of the Society of Sheep and Beef Cattle of the New Zealand Veterinary Association*, pp 71–77, Jan 2016  
[Abstract](#)

### Diagnosing and controlling a campylobacter abortion outbreak in sheep

**Authors:** Gibson M.

**Summary:** This paper describes a reported *Campylobacter* abortion outbreak on a sheep and beef breeding and finishing unit in the Wairarapa region and then discusses the recommended intervention and resulting outcome in the context of the current literature. The case highlights the factors that should be considered in the investigation and management of a *Campylobacter* abortion outbreak so that the best outcome can be achieved for the farmer.

**Comment:** Whilst it is always satisfying to establish a diagnosis when investigating an abortion in outbreak in a client's flock, you can end up feeling a bit ineffective as there is not usually a great deal you can do to change the course of the disease. Recommending that they vaccinate the following year is good advice, but it isn't going to reduce the size of the slinky pile at the time! Well, maybe that's not quite true. Using a case of *Campylobacter* abortion in an unvaccinated Wairarapa flock, Malcolm Gibson (then at Massey University) considers the options available to try and reduce the impact of the disease. The paper is really a combination of a case report and a review article with the author first describing the details of the outbreak (which turned out to be a quite devastating one) and then summarising findings from other studies to evaluate the control options available, both in general terms and also with regard to this specific outbreak.

The paper serves as a good reminder of the various avenues available to us when dealing with ewe abortion outbreaks. After a consideration of the specific features of a case, such as the stage that the diagnosis was arrived at, closeness to the planned timing of lambing and the vaccination status of the ewes involved, you and your client may conclude that some of the options are not feasible or worthwhile but at least it's helpful to be able to present them as part of the discussion.

**Reference:** *Proceedings of the Society of Sheep and Beef Cattle of the New Zealand Veterinary Association*, pp 137–142, Jan 2016  
[Abstract](#)

### First report and histological features of *Chlamydia pecorum* encephalitis in calves in New Zealand

**Author:** Hunt H et al.

**Summary:** This paper reports a case of neurological signs developing in 40 of 150 crossbred Friesian dairy calves on a farm in the Manawatu region. Calves were grazed in multiple mobs and calves from each mob were affected. Initial treatment with thiamine, antibiotics, and non-steroidal anti-inflammatory drugs produced a variable response. Over a 1-month period, 13 calves died or were euthanized. A diagnosis of *Chlamydia pecorum* meningoencephalomyelitis (sporadic bovine cephalomyelitis) was eventually made.

**Comment:** When a quarter of a large mob of calves develop neurological signs, with quite a few of them dying or requiring euthanasia, the stress levels get pretty high. They go up another few notches when the animals test negative for your most likely differentials such as lead poisoning and polioencephalomalacia. This clinical report deals with such an event, which occurred on a Manawatu property three years ago, and which turned out to be a landmark case. The eventual diagnosis of sporadic bovine encephalomyelitis (SBE) was the first time that *Chlamydia pecorum* has been confirmed as a cause of clinical disease in this country.

After a description of the clinical and pathological findings, the authors, an impressive line up of representatives from Massey University, MPI, and our animal health labs, devote much of the paper to the diagnostic challenges and the techniques utilised; a very relevant discussion with *C. pecorum* being an intracellular organism and, therefore, not able to be cultured using conventional methods. Interestingly, after the diagnosis was made, the techniques were then applied to samples still held from two historical cases from Canterbury and Southland, where similar histological lesions were seen. These tests confirmed the involvement of *C. pecorum*, indicating that the organism is already widespread in NZ.

I encourage all readers to familiarise yourselves with the features of this case and add *C. pecorum* to your list of differentials for neurological disease in young stock, especially when the presence of polyserositis, on autopsy, suggests a systemic bacterial involvement. I also refer you to [Issue 5](#) of *Sheep and Beef Research Review*, which included an insightful paper by Walker et al. exploring the possibility of *C. pecorum* also being involved in a range of sub-clinical, production-limiting conditions in sheep and cattle.

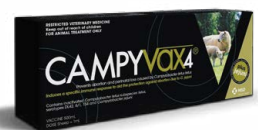
**Reference:** *New Zealand Veterinary Journal*, 2016;64(6): 364–368  
[Abstract](#)

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## Sheep & Beef Research Review

### The influence of lime and nitrogen fertilisers on spore counts of *Pithomyces chartarum* in pasture

**Authors:** Cuttance EL et al.

**Summary:** The aim of this study, which was undertaken on a spring-calving, pasture-based, commercial dairy farm near Te Awamutu, was to determine whether the application of lime or nitrogen to pasture affected the spore counts of *Pithomyces chartarum*. The results demonstrated that application of lime before the risk period for facial eczema, i.e. in November, application of lime after a spore count rise, i.e. in March, or urea application in December, did not affect changes in the number of spores produced by *P. chartarum*.

**Comment:** For a large proportion of NZ's livestock farmers, the threat of facial eczema is a constant concern every summer and autumn. Monitoring pasture levels of the spores of the causative fungus, *Pithomyces chartarum*, and avoidance of the worst affected paddocks was once the most common preventative measure. Nowadays, however, there is a heavy reliance on the application of fungicides to pasture and the administration of protective doses of zinc to the animals themselves. The merits of another control method, targeted application of lime to at risk pasture, have been debated in the farming community for some time. If successful, this strategy would have the benefits of being cost effective, as most farmers apply lime annually anyway, as well as being compatible with organic farming guidelines, an important factor currently with an increasing number of farmers choosing to transition their properties towards organic status.

This study conducted by Waikato vet, Emma Cuttance, endeavoured to assess the effectiveness of the lime strategy by comparing pasture spore levels on treated pasture with that of controls. She looked at applying lime in early summer prior to the expected risk period as well as in autumn, once spore levels were already high. In addition, Emma tested another commonly held belief: that application of nitrogenous fertiliser can actually increase spore counts. For all three scenarios, it appears that the myths were busted! Pasture spore counts were unaffected by any of the treatments. In the discussion, it is mentioned that fungal soil populations have previously been demonstrated to increase when soil becomes more acidic, so there is a scientific basis for the lime theory. However, in the study quoted, the researchers were talking a much bigger range in soil pH (from 8.3 down to 4.5) than you would ever encounter on a typical NZ farming system.

**Reference:** *New Zealand Veterinary Journal*. 2016;64(6):351–355

[Abstract](#)

### Fluid therapy in calves

**Authors:** Hallowell G & Remnant J

**Summary:** This article discusses the various types of oral and intravenous fluids that can be used by farm animal practitioners to treat sick calves that are hypovolaemic, dehydrated, or both. It also describes how to decide which route and which types of fluid are likely to achieve the best outcome.

**Comment:** I don't know about you, but the title of this paper immediately conjured up images in my mind of a hospitalised calf being placed on a drip. Something that I have done occasionally, usually for valuable animals or pet calves (our own included!). However, this article is a lot broader than that, delving into the pros, cons, and methods of both oral and intravenous fluid therapy.

The article, written by two University of Nottingham vets, provides a good refresher on the basics of fluid therapy, including differentiating between hypovolaemia and dehydration, and simple ways to assess the level of severity of each. It then goes on to discuss both oral and intravenous fluid therapy options and recommendations such as the quantities to give, rates of administration, and correction of acidosis. There are even a couple of recipes for home-made intravenous solutions. Not only does the article provide a raft of information that would be helpful when confronted with an individual sick calf in need of fluid therapy, but some of the guidelines would be equally relevant when assisting or advising calf rearing clients dealing with the problem on a larger scale.

**Reference:** *In Practice* 2016;38:439–449

[Abstract](#)

### Local, regional, and spinal anesthesia in ruminants

**Authors:** Edmondson MA

**Summary:** This article discusses in detail the use of local anesthetics for providing anesthesia for certain procedures. It concludes that local, regional, and spinal anesthesia techniques are safe and effective methods for providing anesthesia for common surgical procedures and analgesia for painful conditions in cattle and small ruminants.

**Comment:** As the author of this review article states in her introduction, local, regional, and spinal anaesthesia has a number of advantages over general anaesthesia in ruminants. As well as the reduced risk of toxic side effects and the potential adverse outcomes associated with positioning ruminants in lateral recumbency, these procedures are generally simple, convenient, and, often just as important, are considerably cheaper than general anaesthesia, especially when we are talking about cattle.

Before describing the procedures, Misty Edmondson (a university-based veterinarian from Alabama) discusses various aspects of local anaesthetics in general, including the various agents available, their duration of effect, as well as warnings about toxicity and prevention of overdose (including tips like diluting the agent by 50% in small ruminants where a large area needs to be covered).

The remainder of the article describes the local, regional, and spinal anaesthesia techniques relevant to common surgical procedures, ranging from a couple of methods of eyeball immobilization (for enucleation) to several forms of epidural, right down to local anaesthesia of the teat. Understandably, most techniques are described largely from the perspective of bovine surgery, though where different approaches may be needed in sheep and goats, these are pointed out.

This very informative article covers the topic comprehensively, but it is still easy to read and, although written by an academic from the States, the surgical procedures for which the anaesthetic techniques are described are all procedures that are carried out by practitioners in this country. A worthy reference for all production animal vets.

**Reference:** *Vet Clin North Am Food Anim Pract*. 2016;32(3):535–552

[Abstract](#)

### Field sedation and anesthesia of ruminants

**Authors:** Seddighi R & Doherty TJ

**Summary:** This comprehensive paper discusses the important features of and risks associated with the sedation and general anaesthesia of cattle and small ruminants. It also describes some commonly used drug protocols.

**Comment:** Although I expounded the benefits of local and regional anaesthesia in ruminants in the previous article, there are obviously going to be situations where chemical restraint (sedation and/or general anesthesia) is required. This review paper, by two veterinarians based at the University of Tennessee, is a very comprehensive coverage of this topic. The authors take over two pages to outline the considerations that we should bear in mind to ensure an uneventful procedure and recovery, before they give a brief run down on general aspects of chemical restraint including commonly used drugs, routes of administration, and even suggested milk and meat withholding times. The drug families are only briefly mentioned in this section because the specific actions are covered in more detail in the main section of the article, which is broken down into the following sections:

- Standing chemical restraint of adult cattle.
- Recumbency and general anaesthesia in adult cattle (including induction and recovery).
- Capture of wild and aggressive cattle (may be helpful for those mad heifers who decide that the pit in the middle of the rotary is a good place to explore!)
- Chemical restraint of small ruminants.
- General anaesthesia of small ruminants.

Just like the previous article, this review is a well set-out, easy to read reference that would be a handy inclusion in any rural vet practice's e-library.

**Reference:** *Vet Clin North Am Food Anim Pract*. 2016;32(3):553–570

[Abstract](#)

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