



# Sheep & Beef Research Review™

Making Education Easy

Issue 10 – 2017

THE SCIENCE OF HEALTHIER ANIMALS

[www.msd-animal-health.co.nz](http://www.msd-animal-health.co.nz)



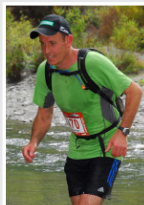
MSD ANIMAL HEALTH IS PROUD TO SPONSOR THIS PUBLICATION AS PART OF OUR COMMITMENT TO VETERINARY EDUCATION



## In this issue:

- Trace nutrients for lambs
- Pre-lambing anthelmintics
- Ryegrass staggers in sheep
- Pharmacokinetics of anthelmintics
- Measurement of *Pithomyces chartarum* spore counts
- Previous reproduction and subsequent fertility in ewes
- Ewe nutrition and lamb neonatal behaviour
- Breeding performance of offspring born to mature or young dams
- Vaccination for bovine viral diarrhoea
- Ad libitum fodder-beet and pasture beef-finishing systems

## 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 tenth issue of Sheep and Beef Research Review.

This issue covers a broad range of research topics across sheep and beef farming practices, including aspects of nutrition, anthelmintics, pasture, disease management, and reproduction and breeding.

We hope that this issue makes for enlightening reading and we welcome your comment and feedback.

Kind regards

**Andrew Roe**

[andrewroe@animalhealthreview.co.nz](mailto: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.

## The vitamin B12 and Se status of lambs during their transition from milk-fed monogastric to grazing herbivore

**Authors:** Knowles SO & Grace ND

**Summary:** Using published literature, these researchers investigated how a lamb's transition from a monogastric at birth to a grazing ruminant at weaning affects its dietary intake of trace nutrients from milk and pasture. Their findings support early monitoring of lambs' trace element status. If a trace element deficiency is detected in lambs at or before docking giving supplements may be appropriate. If adequate, the animals' trace element status should be re-evaluated at weaning.

**Comment:** It is well known that a significant portion of our country's pastoral farming is carried out on soils that do not contain adequate levels of selenium and/or cobalt to meet the dietary requirements of our grazing livestock. A nationwide study by Knowles and Grace in 2014 demonstrated that 46% of those pastures analysed would not provide sufficient cobalt to meet the dietary requirement of sheep and 24% of pastures would not meet the minimum selenium requirement for the growth of lambs. However, advising our clients as to the sensible age to begin supplementing lambs can be difficult, considering the seasonal patterns in availability of some trace minerals, especially cobalt, and the fact that colostrum and milk are often regarded as good sources of such minerals. And, with the young lamb's diet changing markedly during the first few months of life, along with its digestive system, is there any value in testing the selenium and vitamin B12 status of young, pre-weaned lambs to assist with this discussion?

This study, yet another offering from NZ's trace mineral gurus, Neville Grace and Scott Knowles, helps clarify the situation. By reviewing a range of NZ field trials involving serial sampling of unsupplemented lambs, and then using the data to calculate likely B12, cobalt, and selenium intakes, the authors were able to show that monitoring the trace element status of young, pre-weaned lambs is indeed a worthwhile exercise and a valid method of assessing the likely benefit gained from trace element supplementation of lambs over the tailing to weaning period.

**Reference:** *N Z Vet J.* 2017;65(3):113–118

[Abstract](#)



### Comparison of two long acting pre-lambing anthelmintic treatments on the productivity of ewes in low body condition

**Authors:** Bingham C et al.

**Summary:** This study determined if there was a benefit from treating ewes with a low body condition score (BCS) with a controlled-release capsule containing abamectin, albendazole, selenium and cobalt or a long-acting injection of moxidectin pre-lambing on a single property in the central North Island. Treating twin-bearing ewes with low BCS pre-lambing with long-acting anthelmintic agents resulted in increased mean body weight of ewes and lambs at weaning.

**Comment:** There is general agreement amongst parasitologists and vets that the use of long-acting anthelmintic products in pre-lambing ewes increases the risk of the development of drench resistance. To mitigate this risk, we encourage our sheep farming clients to move away from routine whole-flock treatment and, instead, target those animals more likely to benefit from the treatment and/or use them only in those years where the levels of gastro-intestinal parasitism during the perinatal period are predicted to be higher than normal. Such advice is consistent with the messages conveyed on the pan-industry parasite management website, [Wormise](#).

So, when it comes to evaluating the benefits that can be gained from long-acting, pre-lambing anthelmintic treatment, it makes sense to conduct the study using the portion of a ewe flock that we are encouraging our farmers to target. That is exactly what Zoetis veterinary advisor, Clive Bingham, and his team did in this study. Initially published in the proceedings of last year's conference of the Society of Sheep and Beef Cattle Veterinarians of the NZVA, the project looked specifically at twin-bearing, low BCS ewes (as presented by the farmer) and determined whether or not they gained a benefit from one or other of two commonly used long-acting pre-lambing worm products. As well as confirming that the farmer's assessment of low BCS was accurate (only 10% of the ewes presented at the beginning of the project had a BCS of  $\geq 3$ ) the study concluded that ewes in light condition, carrying multiple lambs can, indeed, show a positive response to pre-lambing anthelmintic treatment.

**Reference:** *N Z Vet J.* 2017;65(3):152–155

[Abstract](#)

### Animal physiology and genetic aspects of ryegrass staggers in grazing sheep

**Authors:** Morris CA et al.

**Summary:** These researchers reviewed the literature on ryegrass staggers (RGS) and found that genetic investigations have revealed the existence of genes that influence resistance to RGS but that their identity has not been confirmed and their effect not established.

**Comment:** RGS, a metabolic disease seen in all our farmed ruminant species as well as horses, can have a major commercial impact on our livestock farming due to the associated reduced growth rates as well as having serious animal welfare implications. The problem has been around pretty much as long as we have grown ryegrass, being first reported in this country well before the start of the 20th century. To date efforts to prevent or minimise the incidence and impact of RGS have been largely directed at tackling the problem at a plant level, with the development of nil-endophyte ryegrass cultivars as well as strains of endophyte that still produce those lolitrem compounds that help protect the plant against insect pests but not producing the ones that are detrimental to grazing animals. However, the use of these new ryegrass-endophyte varieties on farms has limitations and their development has not eliminated the problem of RGS.

So, what about looking at the animal side of the equation? We have made progress in NZ selecting for sheep, for example, that exhibit reduced susceptibility to facial eczema so why not RGS? This review paper, by scientists from both AgResearch (including the late Chris Morris) and the Cawthron Institute, examines this very question. The effects of RGS on the physiology of the sheep have been investigated and, as the authors describe, efforts have been made to understand the contribution of genetics to the degree of resistance or susceptibility to the disorder. One such study involved the establishment of two selection lines of sheep at AgResearch; a RGS-resistant line and a susceptible one. After about ten years of selection a considerable divergence in susceptibility between the two lines was observed, indicating that selection for RGS resistance is a feasible option. The authors conclude that the limited studies to date suggest that a multi-gene selection approach will be necessary in order to develop an effective selection tool for use in the agricultural industries.

**Reference:** *N Z Vet J.* 2017;65(4):171–175

[Abstract](#)

**CLICK HERE** to read previous issues of Sheep and Beef Research Review

**SUDDEN DEATH IS A TELL-TALE SIGN OF HIGH PERFORMANCE.**

**COVEXIN 10**  
 RESTRICTED VETERINARY MEDICINE  
 Keep out of reach of children  
 FOR ANIMAL TREATMENT ONLY

Clostridial vaccine for sheep and cattle  
 For the active immunisation of sheep and cattle against diseases caused by *Clostridium perfringens* A, B, C, and D, *C. glutinans*, *C. novyi*, *C. apiculatus*, *C. sordii*, *C. sordii*, and *C. botulinum*.  
 New Zealand developed and manufactured.

VACCINE 100 mL  
 Dose: 5 sheep = 1 mL  
 Cattle = 2 mL

**TALK TO YOUR CLIENTS ABOUT UPGRADING TODAY.**

AVAILABLE ONLY UNDER VETERINARY AUTHORISATION. ACVM No: A9028. \*Registered trademark. Schering-Plough Animal Health Ltd. Phone: 0800 800 543. [www.msd-animal-health.co.nz](http://www.msd-animal-health.co.nz) NZ/C10/0615/0001a

**MSD**  
 Animal Health



## Sheep & Beef Research Review

### Host pharmacokinetics and drug accumulation of anthelmintics within target helminth parasites of ruminants

**Authors:** Lifschitz A et al.

**Summary:** This review of the published literature provides an overview of the relationship between the pharmacokinetic features of different anthelmintic drugs used in cattle and sheep, their availability in host tissues, accumulation within target helminths, and resulting therapeutic efficacy.

**Comment:** I don't think I am unique in the way my eyes glaze over and my mind starts to wander when a discussion on the pharmacological properties of a certain therapeutic agent begins to plunge any deeper than a very superficial level. Certainly, as a vet student, when we were all eager to get stuck into the clinical and practical aspects of what being a vet was all about, it was sometimes difficult to see why we were expected to know so much theoretical stuff. But it's funny how things have a habit of coming the full circle. Now, as a production animal vet, worms, drenches, and drench resistance form a big part of the everyday conversations we have with our clients. And so, questions such as "how does increasing the dose of a poorly effective drench sometimes improve its efficacy?" and "why do oral formulations of macrocyclic lactones (MLs) work better than injectable forms in some cases of reduced susceptibility?" crop up fairly frequently. And eventually you realise the relevance of learning and understanding some of that science!

This review article by researchers at Argentina's Centre for Veterinary Investigation in Tandil, serves as a useful and easy to read update on the pharmacodynamics of our various classes of anthelmintic, explaining how factors such as route of administration, dose rate, characteristics of the target worm species and features of the diet and grazing management of the host animal, all contribute to the efficacy of the product. It's all good background knowledge when grappling with the complexities of parasite management and minimisation of drench resistance. After the introductory paragraphs, the review is divided into sections based on class of anthelmintic. The only shortcoming, from a New Zealand practitioner's point of view is the lack of a section on levamisole. Maybe this anthelmintic is not widely used in South America.

**Reference:** *N Z Vet J.* 2017;65(4):176–184

[Abstract](#)

### Variability in measurement of *Pithomyces chartarum* spore counts

**Authors:** Cuttance EL et al.

**Summary:** The aim of this study was to examine the agreement among spore counts of *Pithomyces chartarum* (sampled from four Waikato dairy farms) obtained using different measurement techniques. The investigators concluded that measuring the spore counts of three aliquots of wash water per 60g grass sample should be used as the standard technique.

**Comment:** I am lucky enough to live in an area of NZ not affected by facial eczema. Although, from a business opportunity consideration, some would argue that I may be unlucky to be based at the southern end of the country! I expect that those colleagues in facial eczema-prone regions will be very interested in this paper by Waikato practitioner, Emma Cuttance, along with input from veterinary faculty researchers from Massey and Melbourne universities. After acknowledging that the current practice of measuring pasture levels of *P. chartarum* spores to assess the facial eczema risk consists of quite a number of steps where variability can occur, the authors then focus their attention on the final stages of the process; those that occur in the practice laboratory. It was found that there was a high degree of variability between:

- Results obtained from separate 60g pasture samples taken from an original 200g sample submitted.
- Results obtained from different aliquots of wash solution taken from one 60g pasture sample.

What's more, the variability increased with increasing spore count. Based on these findings recommendations are made as to how veterinary practices should modify the process to increase the accuracy of the results. It is stressed that, as is the case with most monitoring programmes, the more frequently properties are sampled, the more reliable the subsequent advice will be, as trends are more important than individual results.

**Reference:** *N Z Vet J.* 2017;65(4):192–197

[Abstract](#)

### The influence of previous reproduction on subsequent fertility in multiparous ewes

**Authors:** Scobie DR et al.

**Summary:** Analysing data on 622 lambing events across a 13-year period from a self-replacing flock of Wiltshire ewes, these NZ researchers demonstrated that reproductive performance was not influenced by the previous year, providing that the ewes' liveweight increased between weaning and mating.

**Comment:** The relationship between ewe liveweight at mating and reproductive performance has been well established. I am sure that all NZ veterinary and agricultural students will be able to quote the decades old finding that a 1kg gain in average liveweight leads to a 2% gain in lambing percentage. In more recent times, with improved feeding of our ewe flocks as well as an emphasis on body condition as well as liveweight, it has been demonstrated that the curve does eventually flatten out, once the average condition score of the flock climbs above a BCS of around 3.5.

But there has also been interest in looking at individual ewe performance, in particular the notion that the number of lambs that a ewe rears in one particular season may adversely affect her reproductive performance the next. This study by a team of AgResearch Lincoln and Lincoln University researchers was designed to test that very theory. Mixed age Wiltshire ewes were followed over a 13-year period, which included over 600 lambing events. It was found that, as long as ewes are fed well enough after weaning to allow target mating weights to be reached, the number of lambs reared has no impact on their performance the following breeding season.

**Reference:** *Proceedings of the New Zealand Society of Animal Production, Volume 76, Adelaide, 155–158, 2016*

[Abstract](#)

## Protect now to prevent a Salmonella outbreak.

Salvexin®+B is a proven vaccine against enteric and Brandenburg salmonellosis that helps prevent infection, reduces the impact of a disease outbreak and minimises production losses.



Don't wait until it's too late. Protect against unnecessary ewe deaths by vaccinating with Salvexin+B.

AVAILABLE ONLY UNDER VETERINARY AUTHORISATION.

ACVM No: A9927 \*Registered trademark. Schering-Plough Animal Health Ltd. Phone: 0800 800 543. [www.msd-animal-health.co.nz](http://www.msd-animal-health.co.nz). NZ/SALB/0915/0915





### Does ewe nutrition during pregnancy affect the neonatal behaviour of twin-born lambs?

**Authors:** Gronqvist GV et al.

**Summary:** This study assessed the effects of feeding treatments from mid pregnancy until lambing on the behaviour of twin-bearing ewes and their lambs. The results showed that lambs born to ewes offered a medium feeding treatment were quicker to stand, suck, and follow compared with lambs born to ewes offered an *ad libitum* feeding treatment. The ewe feeding treatments did not affect the maternal behaviour of the ewes.

**Comment:** Adequate ewe nutrition during pregnancy is vital to achieve optimal lamb birth weights, colostrum quality and quantity, and lactation. But a number of studies, both in NZ and overseas, have shown ewe nutrition to also have a bearing on more subtle characteristics such as the ewe's mothering behaviour and the time taken for the lamb to get up and have its first feed.

This study, by the animal science team from Massey's International Sheep Research Centre, further examines this relationship. Where it differs from earlier work, is that almost all the previous research on the topic has looked at the consequences of under-nutrition during pregnancy. The Massey crew, on the other hand, were interested to find out if the additional feed provided to twin bearing ewes on an *ad libitum* pasture regimen lead to any advantages compared to ewes receiving an accepted "adequate" pasture allocation for their stage of pregnancy. And for an additional level of interest the ewes in the study were part of a wider project, having been born to dams that were fed either low, medium, or *ad lib* pasture allocations while they were pregnant! Those lambs whose grand-dams were fed *ad lib* in mid to late pregnancy were quicker to suckle than those whose grand-dams were fed medium allocations. However, the effect of *ad lib* feeding of the lambs' mothers was unexpected and may surprise you . . . take a read and then see what you think of the authors' proposed explanation of the results.

**Reference:** *Proceedings of the New Zealand Society of Animal Production, Volume 76, Adelaide, 8–13, 2016*

[Abstract](#)

### Reproductive performance of singleton and twin female offspring born to ewe-lamb dams and mature adult dams

**Authors:** Loureiro MFP et al.

**Summary:** These researchers compared the reproductive and live weight performance of female singleton and twin ewes born to either mature or young dams. The results indicate that there are few negative consequences from selecting progeny born to ewe lambs as replacement breeding ewes. However, lifetime data is needed to support this hypothesis.

**Comment:** One of the basic principles of animal breeding is that, if you are doing things right, your youngest animals will be genetically superior to the older ones. And so, to make the fastest genetic gain, farmers should keep as many replacements as possible from those ewe lambs born to their hoggets. But how many do? I would suggest very few commercial farmers do. Obviously not all farmers get their hoggets in lamb in the first place and, of those who do, many use rams of a different breed to their base flock, so deliberately don't give themselves the opportunity to retain the female offspring. The offspring of hoggets are smaller than those of older ewes and, as research has shown, typically remain so for at least their first year of life. But does this automatically mean that their performance as breeding stock will be poorer than those animals born to mature ewes? That is a very good question and yet another one which the prolific IVABS animal scientists set out to answer. Even though the authors concede that, to answer the question with confidence, lifetime data of the animals involved needs to be gathered, the results available so far from this very topical study should have many farmers reviewing their replacement ewe selection policy.

**Reference:** *Proceedings of the New Zealand Society of Animal Production, Volume 76, Adelaide, 151–154, 2016*

[Abstract](#)

### Prevention of fetal infection in heifers challenged with bovine viral diarrhoea virus type 1a by vaccination with a type 1c or type 1a vaccine

**Authors:** Packianathan R et al.

**Summary:** This study showed that vaccines containing inactivated type 1c and type 1a bovine viral diarrhoea (BVD) viruses statistically significantly reduced foetal infection following challenge with an NZ type 1a BVD virus. However, as prevention may not be 100% there is a risk of persistently infected calves being born to some vaccinated cattle.

**Comment:** BVD, as we keep reminding our beef and dairy clients, is a complex disease. And the science behind BVD vaccines is just as complex. There are several inactivated BVD vaccines available in NZ, all different and with subtly different label claims. While all vaccines aim to protect the animal being vaccinated, when it comes to controlling BVD it is also important that the foetus of the vaccinated animal is protected as well. What makes things especially complicated is that the BVD virus exhibits wide antigenic diversity and so the results of vaccine studies in one country do not necessarily indicate how well that product could be expected to perform in another country.

This study conducted by the team at Zoetis is only the second BVD vaccine study conducted in NZ and compared the effectiveness, in terms of provision of foetal protection, of two BVD vaccines currently available in this country. While each vaccine contains a different BVD subtype the study revealed that both products were equally and significantly effective in reducing foetal infection with the predominant NZ subtype (1a) when compared to non-vaccinated controls. A very reassuring result for vets and cattle farmers alike. As neither vaccine prevented foetal infection in every animal vaccinated, the authors stressed that even in vaccinated herds there is still a risk of some degree of foetal BVD infection, and therefore the birth of persistently infected calves, and it is important that this risk is acknowledged and managed.

**Reference:** *N Z Vet J. 2017;65(3):134–139*

[Abstract](#)

### Ad libitum fodder-beet and pasture beef-finishing systems – intake, utilisation, grazing behaviour and liveweight gains

**Authors:** Saldias B & Gibbs SJ

**Summary:** This study, which was conducted on a beef-finishing operation in Canterbury, showed that *ad libitum* fodder beet intakes did not result in poor utilisation and appeared to extend diurnal grazing patterns in weaner beef steers.

**Comment:** Fodder beet is a high-yielding crop that has rapidly gained popularity in NZ due to its ability to maximise land use and economic returns by providing a cheaper source of supplementary feed for cattle. Based on national seed sale volumes it has been estimated that the area planted in fodder beet has grown massively from around 100 ha in 2006 to 15,000 ha in 2014. Lincoln university animal scientist, Jim Gibbs, has been a prominent figure in developing strategies for fodder beet feeding, especially when it comes to utilising the crop to finish beef cattle. One method he recently developed involves the *ad libitum* feeding of the crop to beef calves from weaning to spring, followed by a period of grazing good-quality spring pasture, a system which enables the cattle to be ready for slaughter by 12–18 months of age.

A potential down side to this approach is a reduction in utilisation of the crop. Previous NZ crop-feeding experience with brassicas, for example, suggests that increased intakes come at the expense of reduced utilisation of the feed. This study, conducted by Jim Gibbs, along with fellow Canterbury agricultural scientist, Bernardita Saldias, was carried out to determine if the same applies to fodder beet. The study, which looked at utilisation, grazing behaviour and intake patterns, and liveweight gains in steers, concluded that high intakes (<2% of liveweight) and good growth rates, averaging around 1 kg/day, can be achieved on fodder beet without compromising crop utilisation. In fact, the final crop utilisation figure of over 95% is very impressive by anybody's standards.

**Reference:** *Proceedings of the New Zealand Society of Animal Production, Volume 76, Adelaide, 87–89, 2016*

[Abstract](#)

**Privacy Policy:** Research Review will record your email details on a secure database and will not release them to anyone without your prior approval. Research Review and you have the right to inspect, update or delete your details at any time.

**Disclaimer:** This publication is not intended as a replacement for ongoing professional education but to assist in the process. The reviews are a summarised interpretation of the published study and reflect the opinion of the writer rather than those of the research group or scientific journal. It is suggested readers review the full trial data before forming a final conclusion on its merits.

Animal Health publications are intended for those with a professional interest in the animal health sector.