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to read previous issues of Sheep and Beef Research Review

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

The first three selections in this issue deal with aspects of microbial and parasitic infection in sheep. Most of the remaining selections come from the [Proceedings](#) of the 75th Annual Conference of the NZ Society of Animal Production (NZSAP), and include the current status of the sheep dairy industry, the effect of shearing on lamb growth, and a comparison of four beef cattle wintering systems.

We hope that you learn something new from this issue of **Sheep and Beef Research Review**, and we look forward to receiving your comments and feedback.

Kind regards

Andrew Roe

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Prevalence, faecal shedding and genetic characterisation of *Yersinia* spp. in sheep across four states of Australia

Authors: Yang R et al.

Summary/comment: Scouring in weaned lambs, with or without illness and weight loss, is a fairly common occurrence on our sheep farms. A call from a client to investigate such a case would not, at the outset, appear very daunting. You know it is likely to be worms. Or maybe coccidiosis if they are still quite young. But for the occasional case your initial tests rule out parasitism. What next? Perhaps it is just a nutritional thing; a recent dietary change to lush pasture maybe. Farmers are often happy to accept that rationale, especially if the diarrhoea goes away. But sometimes it does not. And then some of the mob does start to go backwards. In such cases I have sometimes turned to micro, with *Yersinia* spp. being identified in some of the samples. But how significant is their presence? Incidental finding or the cause of the problem?

The title of this paper caught my eye in the hope that it would shed some light on such scenarios. It was a longitudinal study the objective of which was to investigate the prevalence, species, and faecal shedding of *Yersinia* spp. in sheep. The project was a large one with nearly 1200 lambs from eight Australian farms being faecal sampled on three occasions between weaning and slaughter. The researchers developed their own quantitative PCR (qPCR), which was able to differentiate between pathogenic *Y. enterocolitica* and other *Yersinia* spp. Unfortunately for me, drawing an association between the presence of pathogenic *Yersinia* and sheep productivity and disease were beyond the scope of the study. However, it did show that these bacteria were widely distributed in all flocks studied and the authors concluded that the qPCR test that they developed may be useful in such investigations in the future. I will continue to watch this space!

Reference: *Aust Vet J.* 2016;94(5):129-37

[Abstract](#)

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Sheep & Beef Research Review

Benzimidazole resistance in *Nematodirus spathiger* and *N. filicollis* in New Zealand

Author: Oliver A et al.

Summary/comment: Although infection with nematodes of the *Nematodirus* genus is usually concurrent with that of other trichostrongylid species, pure infections can occur, with acute cases often having devastating results in young lambs. Such cases are intermittently reported in the lower South Island especially. Of the four species of *Nematodirus* recorded from sheep in NZ, only *N. spathiger* and *N. filicollis* are common throughout the country. The genus has the unusual biological feature of having their free living stages develop on pasture within the egg. For *N. filicollis*, in particular, a period of chilling is generally required for the infective third larval stage (L3) to hatch. As anyone who has conducted a number of faecal egg count reduction tests (FECRTs) will probably have discovered, resistance to anthelmintics of the benzimidazole (BZ) group is relatively common amongst the *Nematodirus* genus, with it first being reported over 30 years ago. While early work identified *N. spathiger* as the culprit, all recent surveys have not identified the particular species involved.

This study, conducted by AgResearch and Massey parasitologists, involved the collection of faecal samples from 3- to 8-month-old lambs across 27 farms throughout the country. They found that levels of *N. spathiger* were higher, with the threshold required in the untreated control lambs for a valid FECRT at the species level (10 eggs/gram) being reached on 21/27 farms involved. *N. filicollis* was present at lower levels, with this target only being reached on ten properties. In addition, the level of resistance was very different between the two species with all but one of these farms having BZ resistant-*N. spathiger* present whereas resistant *N. filicollis* were detected on only 40% of those farms that reached the threshold. The authors put forward an interesting and very plausible hypothesis as to the reason for this difference. They postulated that, because *N. filicollis* requires the period of chilling to stimulate the infective L3 hatch, it is likely that they would only have one, maybe two, generations per year, compared to *N. spathiger*, which may have five or six per year.

Reference: *N Z Vet J.* 2016;64(4):201–20

[Abstract](#)

Helicobacter bilis and *Helicobacter trogontum*: infectious causes of abortion in sheep

Authors: Gill J et al.

Summary/comment: The previous issue ([Issue 5–2016](#)) of *Sheep and Beef Research Review* featured a case study by Michael Cately, describing a ewe abortion outbreak on a Southland property in which *Helicobacter* were implicated. The story continues with the current paper, co-authored by Gribbles pathologist, John Gill, along with five MPI researchers and scientists from three Massachusetts institutions. It is an excellent example of what collaboration between organisations across different countries can achieve. Although *Helicobacter spp.* have been implicated in an increasing number of cases of abortion in the mid to lower South Island, it has not been certain whether or not they were the causative agents in these outbreaks, some of which have been quite devastating. Much of the reason for this is the lack of a diagnostic test in this country. This study aimed to define the association of *Helicobacter spp.* with ovine abortion and understand its importance in NZ.

The project was a retrospective one involving *Helicobacter* testing of liver samples from aborted lambs collected during the spring of 2012. Of the 48 contributing farms, 17 had already had the cause of their abortions identified and so were used as negative control properties. For the remaining 31 farms, routine testing had not revealed any causative agents. Parallel testing was conducted on these samples at two labs: *Helicobacter* culture and PCR testing was carried out at the Massachusetts Institute of Technology while PCR testing only was performed at MPI's Wallaceville Animal Health Lab. *Helicobacter spp.* were not detected on any of the control farms, while 16% of those farms for which no causative agent had previously been found had evidence of *Helicobacter* being present with two species being identified. These results support our suspicions that *Helicobacter* is indeed a likely cause of ovine abortions in this country.

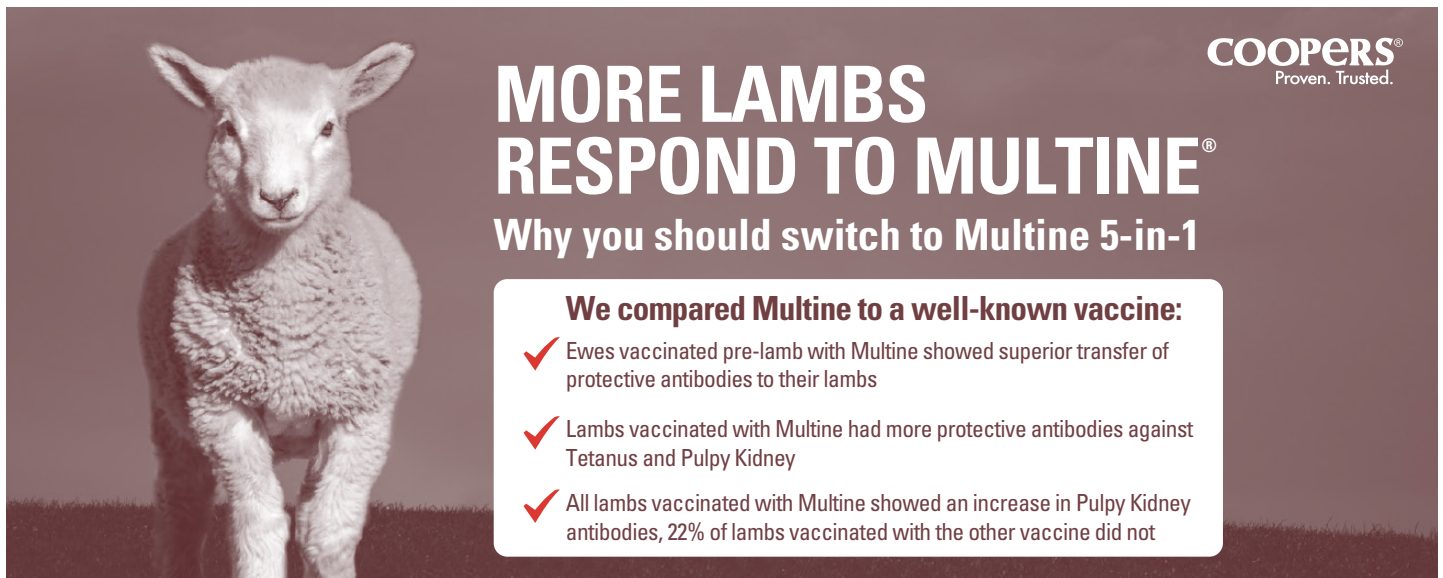
Reference: *J Vet Diagn Invest.* 2016;28(3):225–34

[Abstract](#)



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Sheep & Beef Research Review

Effect of shearing on lamb growth and carcass performance

Authors: McLean NJ et al.

Summary/comment: There are a number of reasons why farmers might elect to shear their works lambs, including incentives provided by meat companies due to the meat hygiene benefits (or disincentives for not shearing them!), additional income from the wool, and the anticipated reduction of diseases such as enzootic pneumonia and flystrike. However, one of the main reasons that farmers give is the belief that, once shorn, their lambs will grow faster.

This project, undertaken by members of the AbacusBio team and funded by the Alliance Group, endeavoured to determine if there was any truth in this popular belief regarding shearing and increased growth rates. The study was conducted on three farms; one in Wairarapa and two in Southland. It was found that shorn lambs did, in fact, have a slightly faster growth rate than their unshorn counterparts, but this benefit was negated by the weight lost during the pre-shearing yarding and fasting process. So, from a financial point of view, the only benefit ended up being the extra income gained from the wool, which equated to between \$1.00 and \$2.00 per lamb, once the cost of shearing was deducted. As mentioned in the introduction to the paper, it is well documented that shearing does increase a lamb's appetite, so it was reasonable to assume that improved weight gains could result. However, the potential gains could well be limited by the availability of enough good quality feed on many farms at the time of year when most lambs are shorn. Environmental factors, especially climatic ones, are also likely to have an influence, potentially leading to a wide variation in any benefits gained between seasons and between different parts of the country.

Reference: *Proceedings of the New Zealand Society of Animal Production, Volume 75, Jan 2015*

[Abstract](#)

The sheep dairy industry in New Zealand: a review

Authors: Peterson SW & Prichard C

Summary/comment: Those vets who attended the annual NZVA conference a few weeks ago would have noticed that there were several papers on sheep dairying in the sheep and beef stream. Their presence on the programme is indicative that this fledging industry is gaining momentum and it is now an area that more than just one or two vets need to become familiar with.

To that end, this paper provides a good insight into where the sheep dairy industry is currently at, and where it may be headed. In Blue River Dairies (Southland), NZ already has what is believed to be the largest sheep dairy operation in the world. And several smaller operations have been going for the best part of 20 years. But with one or two other big players, such as Landcorp, entering the arena, as well as the fact that Food Innovation Waikato's drying plant has started to process sheep milk, the sheep dairy industry appears poised to take off. On the back of these developments and the growing interest in this area the inaugural Ewe Milk Products and Sheep Dairy Conference was held in February last year. A large part of this paper summarises the various workshops at the event and for those interested in more detail there is a set of abstracts from this conference at the back of the [NZSAP 2015 conference proceedings](#).

Reference: *Proceedings of the New Zealand Society of Animal Production, Volume 75, Jan 2015*

[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. **FOR FULL BIO [CLICK HERE](#)**



The influence of hogget liveweight change during their first lactation on pregnancy rates at the subsequent breeding period

Author: Corner-Thomas RA et al.

Summary/comment: A big challenge for those sheep farmers who lamb their hoggets is ensuring that the hoggets continue to grow while they are lactating, so that they have attained a satisfactory liveweight by the time of their two tooth mating. In previous studies, Paul Kenyon and his co-workers have clearly demonstrated that any decrease in two tooth reproductive performance observed following rearing lamb(s) as a hogget can largely be attributed to failure to reach target weights and condition scores by their second mating.

In an effort to maximize the chances of such weights being achieved, there has been interest in using specialist high quality forages. This study, conducted over two seasons, focused on this subject, comparing hogget growth rates during lactation on three different forage types: traditional ryegrass and white clover pasture; a pure lucerne sward; and a herb mix containing chicory, plantain, and red and white clover. Single bearing hoggets were used and remained on the forage in question from one week before the anticipated start of lambing until weaning time. Results were reported and discussed under the following headings:

- Effect of feeding treatment on ewe liveweight, BCS, and reproductive performance.
- Effect of liveweight change on ewe reproductive performance.
- Effect of hogget BCS change on ewe reproductive performance.

There were significant differences in liveweight between the different feed groups and a positive relationship between liveweight and the chances of being bred in the first oestrous cycle. However, this did not translate to any difference in overall reproductive performance between the three feed treatment groups. In this study, it was felt that even though the pasture fed group were lighter than the others they were still of an acceptable weight and condition by their two tooth mating so the extra weight that the other two forages achieved proved to be of no additional benefit.

Reference: *Proceedings of the New Zealand Society of Animal Production, Volume 75, Jan 2015*

[Abstract](#)

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Sheep & Beef Research Review

Suspected levamisole intoxication in calves

Authors: Müller KR & Dwyer C

Summary/comment: This well presented case study is an excellent illustration of how undesirable outcomes can result from the use of animal remedies even in cases where, on the surface, the products are used correctly and according to label instructions. It is well known that, compared to other anthelmintic classes, levamisole has a narrow safety margin. Cases of toxicity in sheep and cattle, involving deaths of the worst affected animals, are reported from time to time. But in nearly all cases overdosing is the underlying cause.

But this case was different. The farmer concerned had done the right thing, weighing his weaner calves and then correctly calculating the dose rate based on the label recommendations. But, despite this, most of the calves developed some degree of levamisole toxicity with 4/36 animals (11%) dying. So what when wrong? The investigation revealed that likely contributing factors were dehydration and stress following prolonged yarding and transportation, as well as possible overdosing of several calves due to the farmer giving a second part dose after he noticed one or two animals spitting some of the first dose out. As well as being an interesting case study, this article is also a great example of the correct protocol to follow when investigating a suspected adverse event.

Reference: *N Z Vet J.* 2016;64(4):257–60

[Abstract](#)

Evaluating information obtained from diagnosis of pregnancy status of beef herds

Authors: Larson RL & White BJ

Summary/comment: Within the NZ dairy industry, analysis of reproductive performance is greatly assisted by the availability of a range of useful data as well as industry-agreed targets relating to these parameters. Nearly all farmers will be keeping track of submission rates, non-return rates, and, eventually, percentage of their herd that was pregnant at mid-gestation. For those conducting their pregnancy testing early enough they will also receive conception rate information. In our beef herds on the other hand, where natural mating is the norm (as opposed to AI) and pregnancy testing is traditionally carried out later in the season, most of this information is unavailable. So, when a beef farmer calls up, wanting some help investigating their herd's poor reproductive performance, we are a lot more limited than we are for our dairy clients.

This paper by two American vets puts a different perspective on this issue. By conducting their pregnancy testing a little earlier than we tend to here, they advocate aging the foetus, not necessarily right down to the day of conception, but rather to periods of 21 days (1st, 2nd, 3rd cycles) post the start of mating. Add to that some monitoring of parameters such as cow condition and nutrition and you are suddenly armed with a lot more information when it comes to analysing reproductive performance as well as pinpointing the potential causes of suboptimal performance. This easy-to-read article is essentially an in-depth review of beef cow reproductive analysis. The first part deals with the methodology and targets while the rest of the article runs through the list of potential impediments to good performance and how to differentiate between them. Strongly recommended for anyone wanting a good overview of this topic.

Reference: *Vet Clin North Am Food Anim Pract.* 2016;32(2):319–34

[Abstract](#)

A comparison of microbial protein synthesis in beef steers fed ad libitum winter ryegrass or fodder beet

Authors: Prendergast SL & Gibbs SJ

Summary/comment: Lincoln University ruminant nutritionist Jim Gibbs, one of this paper's co-authors, has conducted a number of large studies into the use of fodder beet in sheep and beef cattle systems. By grazing the crop standing, on an *ad libitum* basis, with only 1–2kg of a fibre source per head per day, Dr Gibbs has demonstrated that growth rates of over 1kg/head/day in R1 beef cattle are achievable. This is vastly superior to the 200g/day reported for winter brassica crops and, when you factor in the higher DM/ha possible with fodder beet crops, it translates to a potential liveweight production of more than 3000 kg/ha over a 150-day period. I know I am not alone in wondering how such figures are achieved when you consider that fodder beet is a low protein crop with crude protein levels less than 14% DM. This study attempted to shed light on this mystery by testing the hypothesis that the shortfall may be met by way of higher levels of rumen microbial protein synthesis on a fodder beet diet compared to other forages.

The project involved pen feeding yearling cattle, fitted with rumen cannulas, a diet of either winter grass or fodder beet. The cattle were kept in metabolism crates, allowing the total collection of urine and faeces for 10-day periods, with rumen pH, ammonia, urea, and volatile fatty acids (VFA) being measured at strategic times. Measurement of purine derivatives in the urine gave an indication of microbial protein synthesis. The results revealed that fodder beet feeding does, indeed, lead to significantly higher levels of microbial protein production compared to winter grass. So, the mystery has been explained but, like all good research, the study has posed as many questions as it answered with the authors believing that further investigation into the mechanism of this process is warranted.

Reference: *Proceedings of the New Zealand Society of Animal Production, Volume 75, Jan 2015*

[Abstract](#)

Beef cattle wintering systems: effects on cattle and pasture

Authors: Little CL et al.

Summary/comment: Pastoral grazing systems of beef cattle require balancing animal needs with those of the pasture to ensure sustainable, profitable livestock systems. Winter is perhaps the most challenging time in many regions of the country for managing young beef cattle, with an ideal system needing to incorporate good growth rates of the calves themselves, minimal long-term pasture and soil damage, and the maintenance of a good standard of animal welfare. Also, the tightening environmental restrictions being imposed by regional councils, as they look to improve water quality, must also be factored in when planning a cattle wintering system.

This project involved a comparison of the following four R1 beef cattle wintering systems on Massey University's Tuapaka farm in Manawatu:

1. Green-fed standing black oats, break fed using electric fencing.
2. Set-stocked grazing on pasture at approximately four animals/ha, with some hay included.
3. Break-fed on pasture with daily shifts and back fencing.
4. Feed pad where cattle were either fed baleage on the pad or allowed daily pasture breaks depending on soil moisture levels.

Parameters measured included: liveweight gain, indicators of animal welfare (faecal cortisol and behavioural observations such as time spent lying down), and assessments of pasture damage (both subjective and objective measures used).

The results make interesting reading with each system having pros and cons. But overall, the set stocked system came out on top, giving superior cattle growth rates, less pasture damage, and similar or better welfare outcomes compared to the three other groups.

Reference: *Proceedings of the New Zealand Society of Animal Production, Volume 75, Jan 2015*

[Abstract](#)

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