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Issue 2 – 2015

In this issue:

- *Tilmicosin for footrot in merino sheep?*
- *WAAVP's 24th International Conference reviewed*
- *Fodder beet as feed for sheep and cattle*
- *Feeding sheep grains during droughts*
- *Economics of enteric salmonellosis in ewes*
- *BVDV infection in sheep*
- *Testing for BVDV: the options*
- *Can digital thermometers be trusted?*
- *Leptospirosis infection: effects on reproduction and growth*
- *Tonic plantain as feed for sheep and cattle*

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

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Welcome to the second edition of Sheep and Beef Research Review.

Most of this issue is devoted to research reported by veterinary experts at the 2014 Annual Seminar of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association. The selections include papers on fodder beet, Tonic plantain, and cereal grains as feed options, bovine viral diarrhoea virus infection in sheep, enteric salmonellosis in ewes, and leptospirosis infection in sheep and beef. Other selections are a comparison of tilmicosin with lincomycin/spectinomycin for footrot in merino sheep and an assessment of thermometer reliability, which reveals some surprising results.

We hope that the information and knowledge shared in this issue produces benefits in your practice and we encourage your comments and feedback.

Kind regards

Andrew Roe

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Comparison of tilmicosin and lincomycin/spectinomycin combination for treatment of footrot in merino sheep

Authors: Robertson DRH et al.

Summary: In this study, which was conducted on a commercial New Zealand sheep farm, 1076 sheep with active footrot (grade 4) at baseline were assigned to one of two treatment groups: 548 received a single intramuscular injection of lincomycin 5 mg/kg plus spectinomycin 10 mg/kg (Linco-Spectin) as the positive control group and 528 received a single subcutaneous injection of tilmicosin 5 mg/kg (Micotil 300). The sheep were then run together as a single mob. Fifteen days after treatment, the feet of treated sheep were pared and a blinded re-assessment of each sheep was made. Sheep given tilmicosin achieved a significantly higher cure rate than sheep treated with lincomycin/spectinomycin (98.3% vs 93.1%; $p < 0.0001$). The tilmicosin treatment group had significantly fewer new feet lesions occurring 15 days post-treatment compared with the lincomycin/spectinomycin group (0.2% vs 9.6%; $p < 0.0001$). Overall, the tilmicosin group had significantly more uninfected feet 15 days after treatment compared with the lincomycin/spectinomycin group (98.3% vs 83.5%; $p < 0.0001$).

Comment: Footrot is a significant disease in New Zealand sheep, particularly in merino flocks where it has been estimated to lead to a 5% drop in wool production and an 8% reduction in lambing percentage. In economic terms the disease reportedly costs New Zealand farmers around \$11 million a year. Footrot control programmes in our fine-wool flocks are multi-faceted with antibiotic treatment of affected animals being one of the linchpins. A number of actives are effective but the most commonly used option in merino flocks is a commercially available lincomycin/spectinomycin combination. This product achieves cure rates of 80-90% from a single dose and is significantly cheaper than other options. On the downside it comes as a soluble powder, requiring reconstitution and, as it is not registered for use in sheep, a default meat withholding period of 91 days must be observed. The author, Dave Robertson, is a North Otago-based clinician, with expertise in helping his merino clients address their footrot problems. His study compares the cure rates of the aforementioned combination with Micotil 300, an injectable product containing another macrolide, tilmicosin, which is not currently available in this country but is registered in the UK for footrot treatment in sheep. Micotil 300 stacks up very favourably in the study and Dave goes on to make a case for its registration and subsequent availability in New Zealand. He also puts forward a compelling argument as to why such a registration should specify that the drug should only be used under direct veterinary supervision.

Reference: *Proceedings of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association, Annual Seminar 2014, Volume, pp 5-14, Jan 2014*

[Abstract](#)

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World association for the advancement in veterinary parasitology conference 2013: A review

Author: Bingham C

Summary: The 24th International Conference of the World Association for the Advancement in Veterinary Parasitology (WAAVP) was held in 2013 in Perth, Australia. Four topics were covered at the conference:

1. Achieving veterinary-guided parasite control for sustainable sheep production.
2. Lower worm egg counts are associated with higher ewe body condition score (BCS).
3. Assessing risk: Spatial trends and environmental factors for an emerging liver fluke sympatric host species in Alberta, Canada.
4. Haemonchus vaccine: Barbervax.

Comment: The WAAVP holds an international conference every second year. The most recent one took place in Perth in 2013. In this paper, the author, Clive Bingham (veterinary technical advisor with Zoetis NZ Ltd), gives a brief review of four topics covered at this WAAVP conference. The first topic deals with an investigation prompted by the fact that there appears to be a declining use of rural veterinary practitioners in Australia, with the majority of parasitological advice to farmers now coming via non-veterinary sources. After examining the effectiveness of a parasitological monitoring service offered by one rural practice the authors concluded that veterinary-guided parasite management has mutual benefits for both veterinary practices and their farmer clients. The next study Clive reviewed was an American one which revealed that ewes' faecal egg counts during lactation were linked to their body condition score at lambing. The study used the same condition scoring system that we use in New Zealand and found that an increase of one BSC was associated with a 700-900 reduction in faecal egg count. While the actual figures may vary if the study was repeated in this country, the trend observed supports accepted advice here around the use of pre-lambing anthelmintic, namely that it is preferable to target higher risk ewes (such as those of low body condition) rather than implementing routine whole flock treatment. The remaining two studies that Clive reported on were: i) a Canadian epidemiological project which led to the development of a tool allowing prediction of transmission risk areas for a species of liver fluke in elk, deer and cattle; and ii) a report on Barbervax a new vaccine for control of haemonchosis in sheep, which appears quite promising. At the time of the 2013 conference it had just been submitted to the regulators in Australia and South Africa and was expected to reach the market within two years.

Reference: *Proceedings of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association, Annual Seminar 2014, Volume, pp 45–50, Jan 2014*
[Abstract](#)

Feeding fodder beet in New Zealand beef and sheep production

Author: Gibbs J

Summary: Fodder beet use in New Zealand beef and sheep production is growing rapidly, mainly due to an internationally unique 'Kiwi' approach to grazing it profitably. The crop offers novel advances in large yields of high metabolisable energy feed at very low cost in seasons where, historically, energy supply through pasture has been lacking. Recent New Zealand improvements in both fodder beet crop agronomy and specialist finishing feeding systems have opened up new opportunities for cost effective use in both beef and sheep sectors. Improved extension of the knowledge now available for feeding fodder beet will likely fuel the integration of these systems into the broader pastoral community. An important component of that extension will be the emphasis on sound nutritional strategies required to best leverage the economic returns of the crop with positive animal health and production.

Comment: With minimal pasture growth during the winter months, most sheep, cattle, and deer farmers in the lower half of the South Island rely heavily on brassica crops, namely swedes, turnips, and kale, to bridge the gap until spring. While brassicas have a number of attributes they do have some limitations including relatively low and variable yields (4-12 tDM/ha) and only moderate energy levels (10.5-11 MJME/kg DM). They also come with several potential animal health issues including goitrogens and high S-methylcysteine sulphoxide levels. Fodder beet, on the other hand, typically has energy levels of 12 MJME/kgDM with yields of 25-30tDM/ha achievable. And no anti-nutritional compounds have been demonstrated. During the last ten years a growing amount of attention has been paid to the use of fodder beet for livestock in this country, not only as a substitute for winter brassicas, but as a finishing feed as well. Much of the recent research into adapting the growing and feeding management of fodder beet to our conditions has been done by the team at Lincoln University, two of whom prepared this paper. The paper is an excellent reference for anyone looking to advise their farming clients on the do's and don'ts of growing and feeding fodder beet to sheep and cattle. It is a concise source of facts and practical guidelines divided into the following sections:

- Early weaning calves and fodder beet.
- Practical feeding and transition.
- Finishing older cattle.
- Troubleshooting cattle feeding of fodder beet.
- Fodder beet for sheep.

Reference: *Proceedings of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association, Annual Seminar 2014, Volume, pp 83–90, Jan 2014*
[Abstract](#)





Grain feeding sheep in drought

Author: Gibbs J

Summary: Cereal grains are an energy dense feed of a form that allows ready transport, storage, and feeding to sheep affected by drought. While relatively expensive compared with standard feeding costs of pasture-based sheep, grains are often considered an economically-viable feed choice in drought situations that is suitable for preserving the nucleus of the flock by mitigating liveweight loss. There is sufficient international knowledge and experience with the safe and effective use of grains in drought for the New Zealand sheep industry to have confidence in their use.

Comment: With the recent drought conditions in parts of New Zealand, which have been particularly severe and long lasting in North Canterbury, it is topical to take a look at the subject of grain feeding sheep. Especially as these scenarios appear to be happening more frequently than they used to. Lincoln University livestock nutritional expert Jim Gibbs is well qualified to present this review of information around the use of grain. After discussing the nutritional parameters and different attributes of the various cereals available Jim then outlines the strategies around grain feeding in drought situations, including ways to keep the costs down and decision making around the optimal time to introduce the supplement. Practical guidelines and helpful tips are given regarding the process of transitioning the animals onto grain, with reference to young stock as well as adult ewes. Jim concludes with a summary of the important animal health problems that may occur and how to monitor the flock to enable quick action to be taken when problems start to emerge.

Reference: *Proceedings of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association, Annual Seminar 2014, Volume, pp 91–94, Jan 2014*
[Abstract](#)

The cost of enteric salmonellosis in ewes

Author: Topham I

Summary: According to this paper, on a typical Clutha district farm of 2,400 sheep, an average enteric salmonellosis outbreak from the 2013 season affecting 30 ewes is estimated to cost over \$6,000, magnified at the national level. Vaccinating all ewes with a single dose of Salvexin+B after the start of an outbreak reduces losses markedly after 7-14 days. Prophylactic vaccination may be economic on farms having regular (<6 years) outbreaks of any form of salmonellosis (at approximately \$816/year on a typical farm). Disease typically occurs after exposure to stressors, such as yarding, decreased feed intake, or transportation. Costs from forced changes to management may be significant. The cost at a national level is difficult to quantify due to severe underrepresentation of laboratory submissions.

Comment: Outbreaks of enteric salmonellosis in New Zealand sheep flocks have become more frequent in the last decade or so. In the lower North Island, Otago, and Southland, the disease, which mainly occurs from January to May, has gone from being a sporadic occurrence to a commonly occurring condition. While several salmonella species are involved *S. Hindmarsh* has steadily become more and more important, to the point where, in the last few years, it has accounted for over 80% of laboratory-confirmed cases of enteric salmonellosis in sheep. Vaccination in the face of an outbreak has proven to be an effective control measure. But with the disease becoming more common there is an increasing level of interest in routine vaccination, as is practised on many farms with a history of repeated outbreaks of *S. Brandenburg* abortions. This paper, presented by Isobel Topham, a South Otago veterinarian in the heart of Salmonella country, will be useful for those clinicians helping their clients weigh up the pros and cons of such a programme. Using previously reported figures for parameters such as mortality rates, vaccination response rates, as well as farm economic data, Isobel has attempted to quantify the likely cost of an outbreak, considering not only the direct costs such as ewe losses and purchase price of the vaccine but other factors such as opportunity cost of vaccination compared to other commonly employed control strategies.

Reference: *Proceedings of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association, Annual Seminar 2014, Volume, pp 121–126, Jan 2014*
[Abstract](#)

BVDV in sheep, diagnosis and control

Author: King C

Summary: This paper described the case of an outbreak of bovine viral diarrhoea virus (BVDV) infection in sheep on a sheep and beef farm in the Wairarapa. The infection presented as abortion in two tooth ewes, reduced lamb survival, birth of lambs with congenital tremor and hypertrichosis, reduced growth rate in lambs, and a significant economic loss in lamb production. This is a rare event in New Zealand; however, the common practice of co-grazing sheep with cattle, the severity of welfare and economic loss, and the risk of perpetuation of the BVDV virus within the sheep flock indicate that sheep producers should ensure that pregnant ewes and valuable rams are not exposed to cattle chronically infected with BVDV virus. Considerable effort has been expended to educate New Zealand veterinarians about the importance and technical details of BVDV control. This case emphasises why this virus requires urgent and serious attention, and why removal of BVDV from cattle populations should be a priority.

Comment: Thanks to the New Zealand Bovine Viral Diarrhoea (BVD) steering committee and the resources that they have developed, many rural veterinarians are now well versed in BVD control options and the benefits of implementing these on their clients' farms. While the uptake of BVD monitoring and subsequent management strategies have been encouraging amongst dairy herds many of us find it a lot harder to convince our beef farmers of the merits of such programmes. If this sounds familiar this is a paper you should read! After doing so you will be armed with some very useful additional information to take to your next BVD discussion with a sheep and beef client. Pestiviruses, such as BVDV and border disease virus (BDV), are not species specific, with an earlier study reporting a 19% seroprevalence of BVDV in sheep. However, this paper by Wairarapa vet, Caleb King, describes the first case in New Zealand of the virus causing clinical disease in sheep. The resulting devastation makes pretty grim reading: 37% of lambs observed at scanning in the 1400 two toothes had disappeared by docking. And, of those lambs that did make it to docking, 60% had a congenital tremor. The lambs took a lot longer than normal to reach slaughter weight, growing at less than half the rate of their unaffected cohorts with some still on the farm the following June. What's more 15% had to be euthanased after weaning due to the severity of their neurological signs. In addition to describing the case, Caleb gives useful advice concerning diagnosis and control of the condition, as well as the promising results of a Belgian study on the use of a cattle BVD vaccine on sheep.

Reference: *Proceedings of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association, Annual Seminar 2014, Volume, pp 139–144, Jan 2014*
[Abstract](#)

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Testing for bovine viral diarrhoea virus: What are the options?

Author: Hill F

Summary: This paper summarised diagnostic tests for BVDV. Although three BVDV tests are commercially available, a bewildering array of possibilities exists for using them depending on the age, physiological status, and infection status of the animal of interest, as well as the sample collected. For economical investigation, pooled testing methods have been developed, further extending the testing options. Polymerase chain reaction (PCR) and antigen enzyme linked immunosorbent assay (ELISA) both detect the virus, while antibody ELISA detects antibody formed by the immune system in response to BVDV infection.

Comment: With scientific journals and conference proceedings so readily available online these days there is very little need to hang onto hard copies any more. But occasionally you come across articles that you know you will want to go back to time after time so a printed version tacked to the wall of your office is the best way to go. Here is a good example. Fraser Hill of the Palmerston North branch of Gribbles Veterinary Pathology has been a regular and valued contributor at New Zealand veterinary conferences and a willing source of advice to many of us. This paper is another very helpful offering from Fraser. Even for people dealing with BVD cases and advice on a regular basis, the array of tests and the different situations where you use each of them can be quite daunting, especially for scenarios that are less routine. After a brief explanation of the basis of each of the three testing options, Fraser provides a very comprehensive list of all the situations where BVD testing may be needed, ranging from diagnosis of an acute infection to detection of a Trojan cow. He then advises which test to use in each scenario as well as the appropriate testing regimen.

It's already on my office wall!

Reference: *Proceedings of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association, Annual Seminar 2014, Volume, pp 165–170, Jan 2014*
[Abstract](#)

An analysis of the effect of thermometer type and make on rectal temperature measurements of cattle, horses and sheep

Authors: Hine L et al.

Summary: This study compared variation in rectal temperature measurement by seven different makes of thermometer (four digital, two mercury, and one ethanol; n=27). They were first individually tested in a calibrated water bath to identify an effect of thermometer make on recorded temperature. Rectal temperatures of four cattle, four sheep, and four horses were then recorded using the same thermometers. In the water bath test, mean temperature was affected by thermometer make ($p < 0.001$). Mean temperature ranged from 38.0°C for the Digital Large Animal thermometer to 38.3°C, which was recorded by the Rapid Digital thermometer and the three makes of capillary thermometer. An interaction between species and make of thermometer was apparent ($p < 0.001$). In sheep, the lowest mean temperature was recorded using the Capillary Small Animal thermometer (39.2°C) and the highest using the alcohol thermometer (mean 40.4°C). In cows and horses, the highest mean temperatures were recorded by the alcohol thermometer (38.6 and 38.9°C, respectively) while the lowest were recorded by the Rapid Digital thermometer (37.7 and 36.3°C, respectively). Across all species, the Rapid Digital (mean difference 0.89°C; [95% CI 0.71–1.08]) and Genia Digiflash (mean difference 0.61°C [95% CI 0.42–0.81]) both recorded lower temperatures than the reference thermometer (Capillary Small Animal). The alcohol thermometer recorded higher temperatures than all other thermometers (mean difference 0.55°C [95% CI 0.35–0.74] versus reference thermometer). Differences in variance between thermometer types were noted ($p < 0.001$), with the Rapid Digital having the highest (SD 1.47) and the Capillary Small Animal the lowest (SD 0.53).

Comment: While vets are trained to have an enquiring mind and constantly question their findings there are some things that you just accept as always being correct. One of these, for me anyway, is the reading on your thermometer. This study, conducted by members of the Massey's veterinary teaching hospital, has forced me to re-evaluate this stance! Anecdotal observations made when teaching veterinary students led the investigators to question the reliability of some brands of digital thermometer. The fact that it is highly likely that mercury thermometers will soon be phased out in New Zealand was further motivation to assess the accuracy of the digital options. After comparing seven different types of thermometer (four digital, two mercury, and one ethanol) in both a water bath and live animals (cattle, sheep, and horses) variation between thermometer types was, in fact, found. Variation in the water bath was minimal and not believed to be of importance. However, there was wider variation when used in each of the animal species; the difference between highest and lowest temperature when used in sheep, for example, was over 1°C. In all cases, the ethanol thermometer gave the highest reading and the digital brands gave the lower results. Potential reasons for the difference between thermometer types are given in the paper. Of particular concern was that one of the more popular brands of digital thermometer was the one that recorded the lowest temperature as well as the most variation. The authors warn that, as digital thermometer technologies change, the performance of the newer brands should be monitored, especially in livestock.

Reference: *NZ Vet J 2015;63(3):171–3*
[Abstract](#)

Update on research into the effects of Leptospira serovars Hardjo and Pomona on sheep and beef cattle growth and reproduction

Authors: Vallée E et al.

Summary: This paper reported the results of a study conducted on nine commercial sheep and beef farms to estimate the effect of leptospirosis due to Hardjo and Pomona serotypes on animal growth and reproduction. Leptospirosis due to Hardjo was highly present in both sheep and cattle, with around 80% of the animals in each flock or herd exposed in their first two years. Pomona was less frequent and not present on all the farms. The within-farm seroprevalence was also lower for Pomona than for Hardjo, which is in agreement with previous observations in New Zealand sheep and beef cattle (Dorjee et al. 2005, Dreyfus et al. 2011). Neither Hardjo nor Pomona serotype was associated with reproduction losses in sheep or cattle in this study. A trend for lower live weights by 8–14kg around the mating season was observed in non-vaccinated heifers, on two farms with high Hardjo exposure, but no conclusive statistical inference could be made.

Comment: There have been leptospirosis vaccination programmes in the New Zealand pork and dairy industries for decades. The main driver in both cases has been the protection of those people working in these sectors and uptake amongst farmers has been very high. With leptospirosis infection rates demonstrated to be extremely high on our sheep and beef farms (one survey revealed that 97% of properties had at least one seropositive animal) one might (naively) expect a similar level of vaccination usage in this sector. But, as we all know, the opposite is the case. Maybe this would change if it could be shown that there was an economic benefit to vaccination; if it could be shown that subclinical leptospirosis affected animal production. This has been shown to be the case in our deer herds. Emile Vallée et al. designed this study to investigate that very possibility, the first study to quantify the effects of natural leptospirosis infection on sheep and beef reproduction and growth. The study was conducted on nine properties and looked at the difference between vaccinated and non-vaccinated animals in terms of reproductive performance in hoggets, two tooth, and heifers, and growth rates for lambs, calves, and heifers. While no reproductive benefits to vaccination were noted there were trends for improved growth rates in vaccinated animals in all stock classes monitored, though these were not statistically conclusive. Further work using larger sample sizes would be required to confirm these trends.

Reference: *Proceedings of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association, Annual Seminar 2014, Volume, pp 29–34, Jan 2014*
[Abstract](#)

Benefits and uses of Ceres Tonic plantain (Plantago lanceolata) in sheep and beef systems

Authors: Judson HG & Moorhead AJE

Summary: This paper highlighted the benefits of Tonic plantain as a feed option for sheep and cattle. It has characteristics that make it a valuable pasture component for intensive and semi-intensive agriculture. High annual dry matter production, winter activity, and animal health and performance all contribute to the overall effectiveness of this pasture species. Consequently, Tonic plantain has found a number of roles in a range of sheep and beef systems throughout New Zealand.

Comment: Narrowed-leaved plantain has long been recognised for its benefits as a forage herb and has been used in pasture mixes in New Zealand for the last twenty years or so. More recently however it has also been sown as a specialist pasture, either as a monoculture or in combination with white clover. There are now a number of cultivars available in this country; this paper highlights their benefits, with specific reference to "Tonic" plantain, and then goes on to explore five specific ways that this cultivar can be included in our sheep and beef farming systems, namely;

1. As part of perennial pasture.
2. As a monoculture.
3. In combination with summer brassicas.
4. In combination with white clover.
5. In combination with Lucerne.

There is also reference to several animal health issues that can arise, particularly the risk of clinical hypocalcaemia, which has been reported when ewes in late pregnancy transition from high plantain swards onto conventional pasture. This paper is another well organised concise reference on feed options for sheep and cattle that will be useful for veterinarians looking to broaden their knowledge in this field.

Reference: *Proceedings of the Society of Sheep and Beef Cattle Veterinarians of the New Zealand Veterinary Association, Annual Seminar 2014, Volume, pp 95–100, Jan 2014*
[Abstract](#)