Sheep & Beef Research Review™

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In this issue:

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

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

Selections in this issue cover internal parasite management, leptospirosis control, foetal loss in ewe lambs, and challenges encountered in the diagnosis of clostridial infections. Also featured are articles on analgesia for disbudding and comparing dairy grazing and beef production systems.

We hope that you learn something new from reading these selections and we look forward to receiving your comments and feedback.

Kind regards

Andrew Roe

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Parasite management extension - challenging traditional practice through adoption of a systems approach

Authors: Wilson L et al.

Summary: This comprehensive review suggests that, apart from encouraging a change in anthelmintics and a switch to the use of anthelmintics in combination, traditional approaches to extension, particularly around parasite management, have been ineffective. Hence, more effective approaches are required. The review emphasises that the evolving nature of anthelmintic resistance and sustainable management of parasitism require changes in attitudes, knowledge, and behaviour across a range of industry players and proposes that a multidisciplinary team approach is required to effect improvements in parasite management.

Comment: Internal parasite management is a subject close to the heart of most, if not all, sheep and beef cattle veterinarians. While this area of work requires utilisation of our diagnostic and clinical skills, it is the opportunity to demonstrate our advisory and client education abilities that attracts many of us to the topic. Despite this enthusiasm, most of us would agree with the opening sentiment of this major review article: in the thirty or so years since researchers started sounding warnings about anthelmintic resistance in New Zealand, very little has changed when it comes to farmer practice in this area. An overhaul of our thinking with regard to parasite management extension is surely overdue and who better to do it than these three authors: Lab Wilson, Tony Rhodes, and Ginny Dodunski. All have recognised expertise and experience in this field but all come from different professional backgrounds, each one bringing specific knowledge and skills that complement those of the other members of the trio.

After introducing some of the current concepts relating to drivers for behavioural change in general, the authors go on to utilise some of this thinking in describing an alternative approach to encouraging farmers to uptake best practice parasite management strategies. The article then goes on to describe actual experiences with such an approach including a four-year, multi-disciplinary pilot programme. A very comprehensive discussion rounds out the paper, which, in my opinion, is essential reading for all of us involved in assisting our sheep and beef clients in this very important component of animal health planning.

Reference: N Z Vet J. 2015;63(6):292–300

Abstract

Serological patterns, antibody half-life and shedding in urine of Leptospira spp. in naturally exposed sheep

Author: Vallée E et al.

Summary: The aim of this study was to determine within-farm prevalence, longitudinal pattern of exposure measured by serology, antibody titre longevity, and point prevalence of shedding in urine of *Leptospira borgpetersenii* serovar Hardjo and *L. interrogans* serovar Pomona in naturally infected sheep on a sample of eight commercial farms. Within-flock seroprevalence for serovar Hardjo, which reached a maximum at 17–22 months of age, ranged from 79 to 100%. Seroprevalence for serovar Pomona rose above 10% on three farms and increased to 21–54% by 4 to 14 months. Seroprevalences ranging from 3 to 76% for serovar Hardjo and 0.5 to 15% for serovar Pomona were observed up to 3 months of age. The half-life of antibody in response to infection was estimated to be 6.7 (95% CI: 5.8–7.9) months for serovar Hardjo and 6.3 (95% CI: 4.8–9.0) months for Pomona. The prevalence of sheep with urine positive for leptospires on each farm ranged from 11 to 88%.

Comment: To me, leptospirosis control in this country's livestock is a real enigma. After several decades of widespread vaccination, and use of other lepto control measures, in the dairy and pig industries there would be few that would question the importance of these practices in minimising the risk of lepto in humans. Yet, despite well publicised surveys showing that the organism is very widely distributed in our sheep, beef, and deer farms (you would be doing well to find a sheep flock that is not infected!), the uptake of similar programmes in these sectors is extremely low. Clearly, more information is needed before farmers and their advisors decide to move in this area. This paper, by Massey University researchers, describes one such body of work. It builds on previous work that has focused on estimating overall herd or flock prevalence of lepto infection. By repeatedly sampling groups of ewe lambs on eight properties, over a 28-month period, this project was able to build up a picture of seasonal and age-related seroprevalence in these animals. It was also able to provide estimates of the half-life of antibody titres in the sheep. Such valuable information can only help when it comes to designing and promoting lepto control strategies on our sheep farms.

Reference: N Z Vet J. 2015;63(6):301–12
Abstract

Factors associated with fetal losses in ewe lambs on a New Zealand sheep farm

Authors: Ridler AL et al.

Summary: In this production study of ewe lambs on a large farm in the Waikato region during 2011, pregnancy diagnosis was undertaken twice. At the second pregnancy diagnosis, 257/3790 (6.8%) ewe lambs had evidence of foetal loss. Serum antibody titres for *Leptospira interrogans* serovar Pomona appeared generally higher in 10 ewe lambs with foetal loss versus 10 that were still pregnant. In the 2012-born cohort of ewe lambs, 443 were vaccinated with a bivalent leptospirosis vaccine and 882 not vaccinated. Serum was collected from 124 non-vaccinated ewe lambs for measurement of antibodies to *Leptospira* serovar Pomona and *L. borgpetersenii* serovar Hardjo-bovis. Less than 5% of these ewe lambs were seropositive until May, but by August 85% and 48% of animals were seropositive to *Leptospira* serovars Hardjo-bovis and Pomona, respectively. Foetal loss in non-vaccinated ewe lambs was 78/882 (9%) versus 23/443 (5%) in vaccinated ewe lambs. Analysis of combined data from the 2011- and 2012-born ewe lambs (n=5115) showed that loss was associated with pre-mating bodyweight (p=0.003), weight change from pre-mating to initial pregnancy diagnosis (p<0.001), year born, and leptospirosis vaccination status (p=0.013). Among the serologically monitored ewe lambs, there were associations between foetal loss and being seropositive to *Leptospira* serovar Pomona (p<0.001).

Comment: In the previous issue of Sheep and Beef Research Review, two papers were included that highlighted the vexing problem of foetal loss in maiden ewes. On many affected farms the underlying cause remains unidentified despite widespread diagnostic testing in many cases. The overwhelming sentiment is often one of frustration with farmers and veterinarians alike wondering if it is even worth spending the time and money investigating such outbreaks, especially on those farms where routine vaccination against the major pathogens is already being carried out. Well, it is not all doom and gloom! This paper, by Anne Riddler and her Massey team, presents the flip side to the argument. Based around a two-year case study on one particular property, it demonstrates that investigating such cases can, in fact, be very rewarding. After initially suspecting the involvement of lepto in the first year of the study, an epidemiological investigation was set up which confirmed these suspicions in year two. Not only that but the study also revealed that low pre-mating weight and/or low weight gain from mating to scanning in the hoggets was also associated with higher levels of foetal loss. All-in-all, a great demonstration of the benefits of biting the bullet and investigating these cases of reproductive loss in hoggets and maiden two tooths.

Reference: N Z Vet J. 2015;63(6):330–4
Abstract

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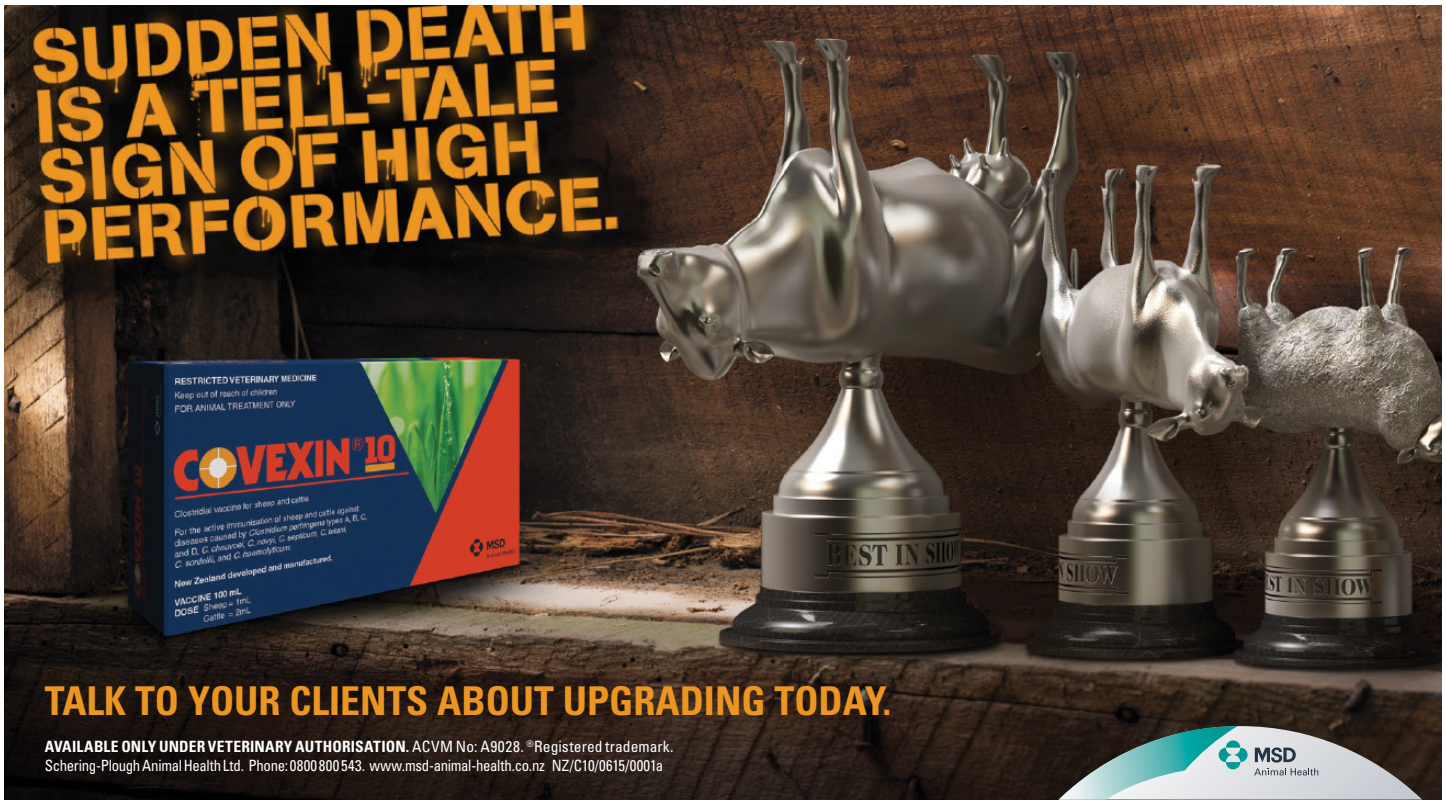

Long acting iodine injections in sheep – what happens?

Authors: Bruere S & Smart J

Summary: The objective of this study was to demonstrate the serum inorganic iodine profile in sheep following a range of different dose volumes of Flexidine over time. The trial was conducted at two properties – one in the Wairarapa and the other in South Otago. Within a fortnight of administration pre-tup, the serum inorganic iodine levels on both properties exceeded those of the control group, suggesting that Flexidine can be administered up to two weeks prior to mating. The raw data indicated that on both properties there was no advantage in using a 2.5mL versus 1.5mL dose one month prior to mating. The decay curve of the 0.75mL/0.75mL group suggested that it is unlikely that a single 0.75mL dose prior to mating would last sufficiently long to provide adequate SII levels over the pre-lamb and lambing period. The raw data from both trials showed that the 0.75mL dose at scanning may be sufficient to protect lambs from the effects of goitre and poor lamb survival. The decay rate of the 0.75mL/0.75mL and the 0/0.75ml groups was similar to the 2.5mL and 1.5mL groups after scanning.

Comment: Sub-clinical iodine deficiency in ewes and their offspring is a problem commonly encountered by farmers in certain regions of the country, especially those areas where winter brassica crops are fed. With oral iodine supplements typically only providing two to three weeks cover, the use of Flexidine, an injectable iodinised peanut oil product, offers farmers the only long-acting iodine supplement available. As far as I am aware, there have been very few, if any, confirmed cases of deficiency (as determined by the newborn lamb thyroid weight to body weight ratio method) following Flexidine treatment. However, with the recent availability of a serum inorganic iodine test, a number of concerns have been raised that Flexidine does not appear to maintain serum iodine levels above pre-treatment levels for as long as expected.

This ground-breaking project was initiated in response to such concerns as well as thoughts that better results may be achieved by deviating from the standard dose and/or timing of treatment. Stu Bruere and John Smart, experienced sheep vets from Wairarapa and South Otago, respectively, two parts of the country where iodine deficiency is frequently seen, used sequential serum inorganic iodine tests in ewes to compare a range of dose rates and timings, including the currently recommended regimen of 1.5mL per ewe given several weeks prior to mating. A number of interesting observations were made, with one of the main messages being that there was no strong evidence to recommend farmers deviate from the status quo. However, on properties where there is no perceived benefit to elevating iodine levels pre-mating, it appears that using a half dose in mid-pregnancy (around scanning time) may be sufficient to protect new born lambs from the effects of subclinical iodine deficiency.

Reference: Proceedings of the Society of Sheep and Beef Veterinarians of the NZVA and Cervetec Conference 309, pp 77-82, Jan 2015
Abstract

Clostridium perfringens infections – a diagnostic challenge

Author: Deprez P

Summary: Before discussing the challenges around the diagnosis of *Clostridium perfringens* infections, this editorial opens by describing how *C. perfringens* is responsible for histotoxic infections such as myonecrosis and anaerobic cellulitis in animals but that its major economic importance lies in causing gastrointestinal infections. *C. perfringens* is typically known for causing enterotoxaemias, where toxins produced in the intestine are absorbed into the circulation potentially leading to intravascular haemolysis, capillary damage, platelet aggregation, and cardiac effects with ensuing shock.

Reference: Vet Rec. 2015;177(15):388–9
Abstract

Increase of *Clostridium perfringens* in association with Eimeria in haemorrhagic enteritis in Japanese beef cattle

Authors: Kirino Y et al.

Summary: These researchers performed a coprological survey with detailed clinical observation of naturally occurring haemorrhagic enteritis (HE) cases to understand the pathophysiology of HE by clarifying the infection status of Eimeria and enteropathogenic bacteria in cattle. Faecal samples from 55 cases of HE and 26 healthy animals were collected and quantitatively analysed. The number of Eimeria species oocysts per gram of faeces (OPG) was >10,000 in 69.1% of HE cases with a maximum of 1,452,500 OPG and *Eimeria zuernii* was found to be overwhelmingly dominant. A significant increase in faecal coliform count was observed in HE cases compared with healthy animals. Among the animals shedding >10,000 OPG, 42.9% showed a marked increase in *C. perfringens* abundance (>104 CFU/g) in the faeces. In the cases with *C. perfringens* detected, its abundance was positively correlated with Eimeria OPG and high *C. perfringens* abundance was always accompanied by high Eimeria OPG.

Comment: The *Veterinary Record* has recently published a number of articles on various aspects of Clostridial diseases. The two summarised here, both on *C. perfringens*, may be of interest to New Zealand sheep and cattle veterinarians. The first is an editorial piece that summaries the significance of this bacteria from a veterinary perspective. It then goes on to outline the difficulties associated with diagnosis and the options available. For anyone with a deeper interest in this area, another article in the same issue (Volume 177 Issue 15) evaluates the usefulness of measuring epsilon toxin in the diagnosis of *C. perfringens* in cattle. The second paper, also published this year, focuses on haemorrhagic enteritis (HE) in beef cattle in Japan. The study set out to gain an improved understanding of the pathophysiology of the disease by carrying out quantitative analysis of coccidial (Eimeria) oocysts and enteropathagenic bacteria in the faeces of both healthy cattle and animals suffering from HE. Results revealed a significant increase in both oocysts and *C. perfringens* in HE cases, implicating these organisms in the pathogenesis of the disease. It was believed that high levels of coccidia enhanced the rapid multiplication of *C. perfringens* in the intestine of these cattle.

Reference: Vet Rec. 2015;177(8): Aug 18 [Epub ahead of print]
Abstract

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Smooth witchgrass toxicity

Authors: Warburton D

Summary: This case report describes the investigation on a central North Island farm of sudden death with signs of photosensitivity in Romney ram lambs grazing predominantly a grass species, smooth witchgrass, not seen previously on the farm.

Comment: In New Zealand, we have a range of pasture and crop weeds that are known to have the potential to cause illness and even death in grazing livestock. However, reports of cases tend to be relatively uncommon. This paper gives an account of one occasion where disastrous consequences did occur following the grazing one such plant. A Central North Island farmer lost nearly half of a mob of 300 lambs, with signs of severe photosensitivity and deaths first occurring about a week after they were introduced to the suspect pasture. Dave Warburton, the investigating vet, outlines the case and the process used to arrive at the diagnosis. With the offending plant being widespread in the North Island, the paper is an interesting report of a scenario that many readers could potentially encounter. It also serves as a lesson in persistence and the importance of taking repeated samples if your first laboratory submissions do not fit with the clinical picture and your own gross findings.

Reference: Proceedings of the Society of Sheep and Beef Veterinarians of the NZVA and Cervetec Conference 309, pp 209-212, Jan 2015
Abstract

Effect of analgesia and anti-inflammatory treatment on weight gain and milk intake of dairy calves after disbudding

Authors: Bates A & Laven R

Summary: The aim of this study was to assess the effect of analgesia at disbudding on weight gain and milk intake of dairy calves. Four disbudding protocols were used on 3- to 6-week-old Friesian-Jersey calves: farm staff disbudded 101 calves without sedation or local analgesia, of which 51 received SC meloxicam 20mg, and veterinary staff disbudded 101 calves with sedation and local analgesia, of which 51 also received SC meloxicam 20mg. From disbudding (day 0) to day 15, farmer-disbudded calves given meloxicam grew faster (0.65 kg/day) than calves no given meloxicam (0.55 kg/day; p=0.011), but an interaction between operator and meloxicam treatment (p=0.056) meant that meloxicam treatment did not increase growth rates in veterinary-disbudded calves (0.63 vs 0.64 kg/day; p=0.872). From days 16 to 30 there was no significant effect of meloxicam on growth rate, but veterinarian-disbudded calves grew faster (0.76 kg/day) than farmer-disbudded calves (0.66 kg/day; p=0.034). For the first 30 days after disbudding, veterinarian-disbudded calves grew faster than farmer-disbudded calves (p=0.002) if meloxicam was not used. However, if meloxicam was used at disbudding there was no difference in growth rate between veterinarian- and farmer-disbudded calves (p=0.878). Mean cumulative milk consumption for the 11 days after disbudding was greater for calves disbudded by veterinary staff than by farm staff (p<0.001), but there was no effect of meloxicam treatment (p=0.618) and no interaction with operator (p=0.86) on cumulative milk consumption.

Comment: There is no denying that calf disbudding using hot iron cautery is very painful and I know I am not alone in thinking that it is an anomaly that current regulations still permit the procedure to be performed without the use of any form of analgesia or anaesthetic. Thankfully, a large proportion of dairy farmers agree and use operators (both veterinary and non-veterinary) who provide pain relief to their calves. But what of the rest of them? If it could be demonstrated that the use of analgesia during disbudding provided an economic benefit maybe more could be persuaded. This study, carried out by Canterbury vet Andrew Bates, investigated this very topic. Using the parameters of milk consumption following disbudding and weight gain over the subsequent 30 days, Andrew compared various combinations of pain relief (including local anaesthetic, peri-operative meloxicam and xylazine sedation) to the use of no pain relief. Results showed that the provision of pain relief had a positive effect on growth rates, not only in the 15 days immediately following disbudding but in the next 15 days as well. The best response was seen in those calves that received local anaesthetic and xyalzine, either with meloxicam or without. Hopefully these findings, once disseminated, will lead to an increased uptake of the use of analgesia at disbudding and, therefore, improved welfare outcomes for our calves.

Reference: N Z Vet J. 2015;63(3):153–7
Abstract

Lamb growth rates and optimising production

Authors: Gascoigne E & Lovatt F

Summary: Low profitability and poor economic returns are common complaints among commercial sheep farmers and yet many do not measure their production costs or monitor lamb performance. An understanding of expected growth rates and the monitoring of weight gains in the commercial sheep flock can have benefits for productivity and be used to inform flock health decisions. This article describes the importance of maximising growth rates in lambs and how this can be achieved.

Comment: *In Practice* is an excellent source of review articles that are relevant and topical and, very often, of a practical nature. This article on lamb growth rates and the importance of maximising them is a typical example. It is also a very comprehensive review covering the impact on the total farm system of optimising lamb growth rates, the physiological aspects of the various stages of lamb growth, ways of monitoring lamb growth rates, and some guidelines into investigating cases of poor growth. As expected, there are some recommendations or suggestions that would not be practical or applicable to New Zealand sheep farming, particularly in the area of monitoring growth rates. But the authors do not confine themselves to UK experiences; in fact, they draw heavily on New Zealand research as well. And I found the early section on the different phases of lamb growth, right from antenatal to beyond weaning, very informative and enlightening. It brings together a range of current thinking and research findings in this area, including a discussion on the not fully understood concept of foetal programming.

Reference: In Practice 2015;37:401–414
Abstract

Beef production vs dairy grazing systems

Author: Bingham C

Summary: With the recent increase in beef prices and the drop in the milk pay-out, it is worth reviewing the merits and the likely financial returns that could be achieved for a farm running either a beef fattening or dairy grazing operation. This article describes the use of commercially available feed budgeting and farm management software package comparing the two systems and the likely return.

Comment: With many sheep and beef vets looking to increase the advisory component of their work, this clear and concise article by Clive Bingham is a great illustration of how we can use these skills to add value to our clients' operations. Using a commercially available feed budgeting and farm management software package, Clive takes us through the process of comparing the likely profitability of a dairy heifer system to a beef heifer finishing one, for a specific property. While the outcome is interesting, the real value of the paper is as a demonstration of how we can use programmes such as Farmax in evaluating various options available to our clients and determining which one yields the greatest return for the feed produced.

Reference: Proceedings of the Society of Sheep and Beef Veterinarians of the NZVA and Cervetec Conference 309, pp 11-14, Jan 2015
Abstract

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