



Sheep & Beef Research Review™

Making Education Easy

Issue 14 – 2019

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Welcome to the latest issue of Sheep & Beef Research Review.

The dominant theme across both sheep and beef production in this issue is infection and infectious disease, including tragic consequences associated with anthelmintic administration by subcutaneous injection in cattle. Outliers to the main theme are articles dealing with pain relief in sheep and production-related metabolic disorders in cattle. And, seemingly defying the title of this publication, a paper on goats is included. Read on to find out why!

We hope that you learn something new from this issue of **Sheep and Beef Research Review**. Please send us your comments and feedback.

Kind regards

Andrew Roe

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Assessment of the efficacy of an autogenous vaccine against *Yersinia pseudotuberculosis* in young Merino sheep

Authors: Stranger KJ et al.

Summary: In this Australian study, six groups (three groups each from two farms) of young Merino sheep were systematically allocated to be vaccinated twice with an autogenous, formalin-killed bacterin vaccine containing *Yersinia pseudotuberculosis* serotype III or to remain unvaccinated. The vaccinated and unvaccinated sheep were run together in their original groups for the duration of the study. The autogenous vaccine had limited effects on seroconversion and no obvious effects on liveweight, mean daily liveweight gain, or faecal shedding of *Yersinia* spp.

Comment: This paper caught my eye, not so much for the assessment of the vaccine, but rather as it draws attention to the fact that yersiniosis is one of the differentials when investigating cases of diarrhoea in sheep. In their introduction, the authors, mostly from the Melbourne vet school, describe the syndrome often referred to as winter diarrhoea, which is commonly seen in weaned Merino lambs in their part of the world. *Yersinia pseudotuberculosis* is one of the causative organisms of the disorder, with quite high morbidity often seen in infected flocks.

While I do not believe it is as much of a problem in NZ sheep flocks, the organism does pop up from time to time when microbiological testing is undertaken as part of an investigation into scouring in young sheep here. I never really know how much significance to place on it. It's one of those diagnoses that I am initially quite pleased to find because at least you've got something to report to the farmer whose money you have just spent on a load of lab tests! But then I struggle to come up with any practical recommendations to deal with it.

Unfortunately, the vaccine did not prove very helpful in this study but it is interesting to learn that the subject is being researched. For a good appraisal of yersiniosis in our livestock in general, check out an [article](#) that John Gill, Gribbles Veterinary Pathology, wrote for Surveillance a little while ago.

Reference: *N Z Vet J.* 2019;67(1):27–35

[Abstract](#)

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Sheep & Beef Research Review

Production responses and cost-benefit of long-acting pre-lambing anthelmintic treatment of yearling ewes in two commercial flocks in New Zealand

Authors: Ridler AL et al.

Summary: In this NZ study, half of the yearling ewes from two commercial sheep flocks in the North Island received a controlled-release anthelmintic capsule (containing albendazole and abamectin) prior to lambing while the other half remained untreated. The treatment with the long-acting anthelmintic resulted in increased ewe weaning weights and weight of lamb weaned in both the flocks and an economic benefit in the one flock that this was assessed for this parameter.

Comment: There is pretty much universal agreement that the use of long-acting, pre-lambing anthelmintic treatment in ewes increases the risk of anthelmintic resistance. Consequently, most advisors, as well as some manufacturers and the more responsible resellers of such products, discourage routine whole-flock treatment, instead advocating a more selective approach. Not only does this advice stack up from a sustainability viewpoint, but studies conducted over the last few years suggest that it can be justified economically as well. Results have been varied when the cost benefits of treating the bulk of a flock have been quantified, while those trials in which specific portions of a flock, e.g., low body condition ewes, were targeted have tended to reliably demonstrate a benefit.

Pregnant hoggets are one stock class that has not been scientifically evaluated in this regard . . . until now! This paper, by authors from Massey, AgResearch, and farm consultancy business, Baker Ag Ltd, looks at the benefits of pre-lamb treatment of hoggets with a double-active, controlled-release anthelmintic capsule, in terms of weaning weight of both the ewes and their offspring. A cost-benefit analysis was also conducted on one of the farms involved in the study. It was good to see that this analysis included the indirect benefit gained from improved ewe hogget weight at weaning; namely, the potential lift in subsequent reproductive performance due to attaining a better mating weight as a two tooth.

Reference: *N Z Vet J.* 2019;67(2):105–108

[Abstract](#)

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

Efficacy of meloxicam in a pain model in sheep

Authors: Colditz IG et al.

Summary: Using a validated pain model involving sterile acute inflammation, these Australian researchers demonstrated in a dose-ranging study that subcutaneous meloxicam 1.0 mg/kg provided significant analgesic benefits in mature Merino ewes, although no significant effects on inflammatory parameters were observed.

Comment: With heightened awareness of the importance of, and our obligations concerning, analgesia in all of species we deal with, the use of anti-inflammatory drugs in sheep has grown in recent times and will continue to do so. For those practitioners already using and dispensing meloxicam for use in sheep, this paper, funded by Boehringer Ingelheim, will reassure you of its effectiveness . . . and at the current label dose rate of 1 mg/kg.

Also of interest to me, was the pain model used in the study, which was conducted at the CSIRO laboratory in Armidale, New South Wales. Apparently subcutaneous turpentine injections can induce signs of acute inflammation and pain, including swelling, raised skin and body temperature, reluctance to bear weight on the affected limb, and a reduced appetite. As such, turpentine injections provide a good model to measure the benefits of anti-inflammatories and analgesics. In this study the injection site was the anterior aspect of the lower forelimb of the sheep involved and meloxicam was shown to reduce the signs of pain. I can sympathise with the sheep used in the study, having splashed turpentine into small cuts on my fingers while cleaning up after painting. Pity I didn't know about this meloxicam study then!

Reference: *Aust Vet J.* 2019;97(1-2):23–32

[Abstract](#)

Laparoscopic ovariohysterectomy in goats

Authors: Daniel AJ et al.

Summary: In this small study, US researchers demonstrated that a minimally invasive three-portal laparoscopic approach for elective ovariohysterectomy is a viable alternative for elective sterilization of female goats. Median surgery time was 43 minutes. No intra-operative complications were reported and, apart from one goat requiring rescue analgesia post-operatively, no postoperative complications were recorded. Additionally, all owners were satisfied with the outcome of the procedure.

Comment: Before you mock me for not only mentioning goats in a publication entitled "Sheep and Beef Research Review", but also for including a paper on spaying them, I need to tell you about Mary, a former colleague of mine. Before coming to work in NZ, Mary was in mixed practice in Devon where, among her many attributes, she took on the mantle of her clinic's chicken spayer! That's right, as well as their many other strange hobbies such as downhill cheese rolling and eating mushy peas, the people of England also keep chickens as pets, with no interest in their egg laying abilities. And, to ensure they live to a good age and don't succumb to diseases such as egg yolk peritonitis, some chicken owners choose to have their beloved chickens spayed!

So, if you are sceptical about the future demand for female goat de-sexing services, just remember that stranger requests have been made of our profession. I, for one, have had a number of clients with goats suffering from pseudopregnancy, a recurring and vexing problem for both the owner and the animal. Spaying such does could be an option in these cases. This paper describes a laparoscopic technique for ovariohysterectomy in goats, which yielded good result across the 16 animals it was trialled on. Sure, not all veterinary practices have access to laparoscopes, but given the number of vets involved (either currently or formerly) in sheep and goat AI/ET work, I suspect that there will be a sprinkling of suitable equipment around the country for anyone wanting to expand their services, especially among their small-block owner clientele.

Reference: *J Am Vet Med Assoc.* 2019;254(2):275–281

[Abstract](#)

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Sheep & Beef Research Review

Nematode parasites in young cattle: what role for unexpected species?

Authors: Waghorn TS et al.

Summary: These NZ researchers investigated the timing of infection of beef calves with sheep nematode species on three sheep and beef farms and determined the prevalence of cross-infection in calves before weaning on a larger number of farms. They concluded that the implications of sheep nematode species being present in calves should be considered when undertaking anthelmintic efficacy testing, as they may contribute to false conclusions regarding anthelmintic efficacy. Pre-weaning calves may also be a possible source of contamination and/or refugia for *Haemonchus* spp. on farms and should be considered when developing parasite control plans for sheep.

Comment: When developing a parasite management plan for sheep and beef farmers, one of the common recommendations is to use other classes of stock to help create “clean” pasture for the lambs. As well as adult ewes, cattle can be used for this purpose, on the assumption that, apart from the possible exception of *Trichostrongylus axei*, cattle and sheep do not share any of the important abomasal or small-intestinal nematode species.

This interesting study by parasitologist, Tania Waghorn, and other members of the AgResearch Grasslands team, challenges this thinking. The study looked at young beef cattle on a number of North Island farms with a view to determining what proportion of the eggs found on calves’ faecal egg counts were actually sheep associated species. The main concern at the start of the project was the possibility that anthelmintic efficacy testing on cattle could provide misleading results if it was primarily sheep worms that turned out to be the resistant ones. However, as well as addressing this issue, the results of the study posed a number of questions that challenge our current assumptions around host specificity of some of the important nematodes of our livestock. The consistent finding of significant amounts of *Haemonchus* eggs in calf faecal samples, for example, raises the possibility that cattle may actually contribute to the population of this parasite on sheep and beef farms (which could have both a positive effect, via offering a source of refugia, as well as a negative one), as well as the possibility that young cattle may actually be detrimentally affected by worm species traditionally thought to have an impact on sheep only.

Reference: *N Z Vet J.* 2019;67(1):40–45

[Abstract](#)

Associations between *Theileria orientalis* Ikeda type infection and the growth rates and haematocrit of suckled beef calves in the North Island of New Zealand

Authors: Lawrence KE et al.

Summary: This was a prospective longitudinal study in which calves from four purposively selected beef farms in the North Island of NZ (two farms from high-risk and two from low-risk tick areas) were blood sampled and weighed in late spring, mid-summer, and early autumn. Associations between calf sex, sampling time, and individual farm and *Theileria orientalis* Ikeda type infection intensity and haematocrit were also investigated. The results demonstrated negative welfare and economic effects of *T. orientalis* Ikeda type infection in suckled beef calves.

Comment: It is now seven years since the arrival of *T. orientalis* (Ikeda type) into this country and the parasite has since spread throughout much of the North Island. The Ikeda type is the most pathogenic form of *T. orientalis*, with the clinical effects of lethargy, jaundice, pyrexia, and even abortions and death being well documented.

However, now that the parasite is considered to have reached endemic stability from Waikato northwards it is possible that its sub-clinical impact will be more significant than that of clinical disease. In Australia, for example, it is estimated that infection with *T. orientalis* costs the red meat industry nearly A\$20 million annually. This study, reported by Kevin Lawrence and other members of both the veterinary and agricultural schools at Massey University, aimed to get a handle on whether similar losses are likely in this country, by looking at the impact of *T. orientalis* infection on the growth rates of beef calves. The results of the project, which revealed a correlation between infection intensity and daily growth rate in the calves, suggest that beef farmers in the North Island do, indeed, have reason to be concerned about the animal welfare and economic impacts of this parasite.

Reference: *N Z Vet J.* 2019;67(2):66–73

[Abstract](#)



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Independent commentary by Andrew Roe.

Andrew worked as a mixed practice vet in Central Southland for almost 30 years. With sheep, beef, and deer being the predominant farming types when he moved to the region, he developed a special interest in these areas of veterinary practice.

Being a founding director and former shareholder of VetSouth he also has experience in practice management and governance. He is involved in the wider agricultural industry through his facilitation roles with Beef + Lamb NZ and Deer Industry NZ. Andrew is the current editor of the *Grazing Gazette*, the newsletter of the sheep and beef cattle special interest branch of the NZVA, and represents the interests of sheep, beef, and deer vets on the NZVA’s Standards Committee.

Along with wife Sam, Andrew recently moved up the road to South Otago, joining Clutha Vets, where he is looking forward to furthering his experience in sheep and beef practice.



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Urine retention in cattle putatively associated with injection of an ivermectin and closantel anthelmintic formulation into the ischiorectal fossa

Authors: Castillo-Alcala F et al.

Summary: These NZ authors report how 22 of 39 Friesian bulls presented with anorexia, abdominal pain, and urine dribbling over the 50 days following administration of ivermectin/closantel anthelmintic via intended subcutaneous injection in the ischiorectal fossa. Transrectal ultrasonography of 17 bulls revealed urinary bladder distension in all 17 and peritoneal fluid accumulation in some. Eight bulls died or were subjected to euthanasia and on-farm post-mortem examination of three bulls revealed urinary bladder rupture. Post-mortem examination of one bull at Massey University revealed that the right ischiorectal fossa contained multifocal areas of tissue fibrosis that extended into areas innervated by the distal cutaneous branch of the pudendal nerve and the pelvic nerve. Histopathological changes consisted of extensive fibrosis, myonecrosis and neurodegeneration, and evidence of granulation tissue and inflammation at the putative injection site and in surrounding tissues.

Comment: How often, when we prescribe or dispense injectable veterinary medicines, do we go into detail about technique? Hardly ever, if a brief survey that I have just conducted is anything to go by. Admittedly, my study is not very powerful, mainly due to a fairly small sample size; n=1 (myself!). But I have a hunch that if I repeated the survey over a wider sector of our profession the outcome will not change much.

Sure, we will usually advise on the route of administration; intramuscular, subcutaneous, etc., but do we need to get more specific than that? And, not just on the injection site itself but other aspects of injection technique as well? This clinical communication, by a team from Massey's vet school, as well as the attending practitioner, Garth Riddle, would suggest that we do. The paper details the horrific consequences that resulted from nerve damage caused by "subcutaneous" injection of an anthelmintic formulation into the ischiorectal fossa of R2 Friesian bulls. While off-label (with regard to injection site) use of injectable compounds is very widely practised, largely for reasons of operator safety and convenience, this case provides a very dramatic warning that maybe it's not always a good idea!

Reference: *N Z Vet J.* 2019;67(3):148–154

[Abstract](#)

Border disease in cattle

Authors: Braun U et al.

Summary: In this review article on Border disease virus (BDV) infection in cattle, the authors discuss how the clinical, haematological, and pathological-anatomical findings in cattle infected with BDV resemble those in cattle infected with the closely related pestivirus bovine viral diarrhoea virus (BVDV). Hence, the diagnosis of BDV infection can be challenging. Pestivirus is relevant in countries with control programmes to eradicate BVD virus in cattle because pestivirus infections in sheep, which act as reservoir for BDV, are not usually included in the eradication scheme. Although interspecies transmission of BDV between sheep and cattle occurs regularly, BDV in cattle appears to be of minor importance. Outbreaks of BDV infection at farm or local level can, however, be very costly.

Comment: Border disease (aka hairy shaker disease, in NZ) seems to be most common in the lower South Island, with the virus endemic in many sheep flocks. Large scale clinical disease pops up from time to time, usually as a result of mixing naïve groups of ewes/hoggets with those from infected flocks. But, as has become more widely recognised in recent times, Pestiviruses are not as fussy about their host species as was once thought. BDV is no exception, as I have found out first-hand. Well, second-hand actually, after one of my colleagues at Clutha Vets recently diagnosed the virus as a cause of chronic ill thrift in a calf.

And, due to the challenges in differentiating infection of BDV with that of BVDV, this scenario may be more common than we realise, especially as sheep and beef cattle co-grazing is common in our country. This paper discusses this conundrum, covering the risk factors, diagnosis, and implications of border disease in cattle. Perhaps the most pertinent aspect of the paper is the importance that the virus could have in those countries looking to eradicate BVD from their cattle population. Quite relevant, as NZ is considering that very concept at the moment.

Reference: *Vet J.* 2019;246:12–20

[Abstract](#)

Factors associated with septic arthritis of the distal interphalangeal joint in beef cattle: A case-control study

Authors: Chamorro MF et al.

Summary: These US researchers aimed to identify factors associated with septic arthritis of the distal interphalangeal joint (DIJ) in beef cattle with a complaint of single-foot lameness. Asymmetric swelling at the coronary band of the affected foot and a lameness score of $\geq 4/5$ significantly increased the odds of diagnosis of septic arthritis of the DIJ compared with no asymmetry of the coronary band or lameness scores < 3 .

Comment: Lameness diagnosis and treatment in beef cattle can be a real challenge. Due the extensive nature of many beef properties, affected cattle are often a long way from the nearest set of yards. And even if the animal concerned can be walked to the yards, not many beef cattle yards are very well equipped to do a thorough examination of a cow or bull's foot. And in NZ, possibly unlike the UK where this study was conducted, we are often under pressure from farmers to make a diagnosis over the phone and try to give some guidance as to whether the lame animal is worth treating or getting a vet out for.

The authors of this paper acknowledge some of these diagnostic challenges, albeit for a slightly different set of reasons to our situation. The case-control study looks specifically at one cause of lameness in beef cattle; septic arthritis of the DIJ and aimed to identify those factors most strongly associated with the condition. A lameness score of ≥ 4 (on a 1–5 scale), as well as the presence of asymmetric swelling at the coronary band, both strongly increased the probability that the lameness in question was due to infection of the DIJ. Interestingly enough, duration of the lameness did not appear to be associated with the condition.

Reference: *Vet J.* 2019;244:104–111

[Abstract](#)

Production-related metabolic disorders of cattle: ketosis, milk fever and grass staggers

Authors: Mann S et al.

Summary: In this review article, the authors discuss the current available literature on various treatment strategies for ketosis, hypocalcaemia (milk fever), and hypomagnesaemia (grass staggers) in periparturient cattle. These metabolic diseases typically occur when the demands for milk production overwhelm physiological regulatory mechanisms. The practical applications of the research are emphasised to provide current evidence-based treatment protocols.

Comment: Although dealing with cases of metabolic disease falls more into the domain of dairy cattle vets, especially when investigating problems at a herd level, sheep and beef vets are sometimes called out to treat beef cows suffering from metabolic problems.

Like most review articles in "In Practice" this paper, by assistant professors from the veterinary colleges of a couple of American universities, is a great mix of the latest knowledge and helpful practical advice. While I believe that most NZ production animals vets, especially those working in the dairy sphere, will be familiar with the bulk of the information provided, the paper could still serve as a good refresher, as well as an update on recent developments in our understanding of the complex aetiologies of ketosis, milk fever, and grass staggers, and also in the treatment and prevention of these conditions. I was particularly interested in the discussion on the negative impact of the homeostatic mechanisms that kick in following standard milk fever treatment (which can interfere with the cow's recovery from the disorder) and the advice given to manage this.

Reference: *In Practice* 2019;41:205–219

[Abstract](#)