# Sheep & Beef Research Review™

Making Education Easy

Issue 1 – 2015

## In this issue:



**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.

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# Welcome to the first edition of Sheep & Beef Research Review.

This Review is the second in a series of Animal Health Reviews (after Dairy Research Review) and is a summary of what we think are some of the most significant recent papers in the field of sheep and beef farming research. In addition we provide expert local commentary on why they are important and how they can potentially affect your practice.

The Review also provides website links to the abstract or fully published papers so you can make your own judgements. The selection and review of each study is independent.

If you have friends or colleagues within New Zealand who would like to receive our publication, please send us their contact email and we will include them for the next issue.

We hope you find this first edition of Sheep & Beef Research Review stimulating reading and welcome your comments and feedback.

Kind regards

**Andrew Roe**

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## Estimates of genetic parameters for breech strike and potential indirect indicators in sheep

**Authors:** Pickering N et al.

**Summary:** This case-control study was conducted during 2009/10 and 2010/11 and involved 17 Romney-based flocks on 11 farms from throughout New Zealand. Farmers observed lambs with flystrike and recorded dag score, breech bareness score, and flystrike location for each lamb. Heritabilities and genetic and phenotypic correlations were estimated for breech strike, dag score and breech bareness using an animal model. During the 2009/10 season, 484 cases of flystrike were recorded with the mean incidence rate per farm being 1.76% (0.47-2.95%). The corresponding results for the 2010/11 season were 352 cases and an incidence rate of 2.54% (0.43-8.18%). Over both years, 694/792 (88%) cases of flystrike occurred on the breech. Heritabilities on the observed scale were 0.32 (standard error [SE] 0.10) for breech strike, 0.23 (SE 0.09) for dag score, and 0.35 (SE 0.11) for breech bareness. Breech strike had a high positive genetic correlation with dag score (0.71) and a low negative genetic correlation with breech bareness (-0.17). Additionally, breech strike had a high phenotypic correlation with dag score (0.62) and negative phenotypic correlation with breech bareness (-0.06).

**Comment:** Flystrike has been estimated to cost the New Zealand sheep industry $40-50 million dollars annually due to the cost of control strategies and lost productivity. With increasing consumer concerns about insecticide usage there has been interest in investigating the use of host resistance as an aid to controlling the problem. Previous studies on flystrike resistance in sheep, largely carried out in Australia, have shown that this is a heritable trait and that selection for it has merit as a control strategy. Because of previous suggestions that some cases of flystrike go undetected and, therefore, prevalence rates may be higher than estimated, the authors of this study believed it would be helpful if reliable indirect indicators could be found. Accordingly, this study, as well as aiming to determine flystrike incidence, looked to quantify the relationship between flystrike and easily observed phenotypic traits. The study was performed on 17 Romney flocks throughout New Zealand and found strong genetic and phenotypic correlations between breech strike and dag score. They concluded that dag score was a viable option for indirect selection for breech strike resistance, at least in the Romney breed in this country.

***Reference: N Z Vet J 2015;63(2):98–103***

Abstract

## Epidemiology of vaginal prolapse in mixed-age ewes in New Zealand

**Authors:** Jackson R et al.

**Summary:** Two longitudinal studies were conducted over two years on voluntarily participating sheep-breeding farms in Hawkes Bay (HB) and Southland regions of New Zealand to identify factors associated with the incidence of prolapse in cohorts of 200 individually identified mixed-age (MA) ewes and in all MA ewes. Overall annual incidences of prolapse on 113 farms in 2000 and 88 farms in 2001 were 1.21 and 0.82 per 100 MA ewes, respectively, and 1.05 for both years combined. A total of 406 prolapses were recorded among 36,695 individually-identified cohort ewes. Individual farm incidences for both years varied from 0 to 5.9 (mean 1.56; median 1.39) per 100 ewes on Southland and 0 to 3.9 (mean 0.75; median 0.54) per 100 ewes on HB farms. The crude relative risk of a prolapse occurring in a MA ewe was 5.31-fold higher for ewes carrying twins and 11.3-fold higher for ewes carrying triplets, than single lambs. Risk factors in the individually identified cohorts were: i) access to salt and feeding of swedes in the latter part of pregnancy, ii) moderate to steep lambing paddocks, iii) multiple lambs detected at scanning, and iv) weight gain between the start of mating and scanning. Neither culling policies for female offspring of affected ewes nor feeding hay or grain in late pregnancy influenced incidence at the farm level.

**Comment:** Ask New Zealand farmers what they find most frustrating about sheep farming and many will say bearings (well, most will say low returns for their lambs, but bearings will be a close second!). While other animal health issues are far more significant economically on a national scale, some individual flocks can experience 'outbreaks' of vaginal prolapse with up to 10% of a flock affected. Also, the fact that farmers feel helpless to prevent the problem and that attending to affected ewes is time consuming at a time of year when farmers are already very busy, leads to increased frustration even for those farmers experiencing the more common levels of 0.5-1%. It has been postulated that a large part of the costs of vaginal prolapse is the lost productivity on farms were the dietary intake of ewes is deliberately restricted due to the belief that this will reduce the incidence of the problem. This large scale study, involving 200 individually recorded ewes on each of over 100 New Zealand farms over two years , looked to assess a range of potential risk factors for vaginal prolapse, including nutritional status, body condition, pregnancy status, farm topography and tail length. Despite commonly held beliefs, the condition of a ewe at lambing was not shown to be a risk factor and nor was the quantity of feed offered in late pregnancy. Nutrition in early pregnancy, however, appears to have an impact, with those ewes that gained condition between mating and scanning having an increased risk of vaginal prolapse. Pregnancy status, as expected, was a risk factor, with triplet-bearing ewes in particular having a much greater risk than those with singles. Similarly, steeper terrain also increased the risk. There was also an association with feeding of salt during pregnancy and with feeding swedes rather than pasture in the latter part of the pregnancy.

***Reference: N Z Vet J 2014;62(6):328–37***
Abstract

## Brief communication: ewe ultra-sound pregnancy diagnosis and its use by New Zealand farmers

**Authors:** Corner-Thomas RA et al.

**Summary:** The aim of this study was to assess the use of pregnancy diagnosis at a national level in New Zealand. A printed survey was distributed to approximately 12,000 sheep farmers within the Heartland Sheep magazine (NZX Agri, Feilding New Zealand) in October 2012. The survey contained the question: which of the following best describes your use of ultrasound pregnancy scanning? Responses to the survey showed that, although the use of ultra-sound pregnancy scanning was relatively common, there remain a significant proportion of farmers (33.9%) that do not know the pregnancy status of their ewes. The survey results also suggested that the use of pregnancy diagnosis is greater among younger than older farmers.

**Comment:** Ultrasound pregnancy diagnosis has become an extremely valuable tool for New Zealand veterinarians working in the sheep sector. A number of practices have embraced the technology and offer the service to their clients. And, on a much broader scale, scanning information is heavily relied upon when monitoring a client's reproductive performance or investigating reproductive issues. It is therefore a concern to read the findings of this survey conducted a couple of years ago. There are still around a third of all sheep farmers in New Zealand who do not know the pregnancy status of their ewes. The implications are far reaching; not only is this group of farmers less equipped to assess and make improvements to their flock's reproductive performance but they are also less able to target their feed for optimum results. And, in a time when adverse climatic events seem to becoming more frequent in many parts of the country, the impact of this is only likely to get greater.

***Reference: Proceedings of the New Zealand Society of Animal Production. 2014;74:65–67***
Abstract

## Seroconversion and semen shedding in rams experimentally infected with Brucella ovis

**Authors:** Ridler AL at al.

**Summary:** This 8-week study was performed to determine the time taken for rams to develop antibodies to Brucella ovis in serum, shed B. ovis in semen, and develop lesions of epididymitis following infection with B. ovis. Fifteen 19-month-old rams were artificially infected with B. ovis by inoculation (day 0). Serum was collected from each ram at 2- to 8-day intervals and tested using a complement fixation test (CFT) and an enzyme-linked immunosorbent assay (ELISA), with selected samples also tested using a gel diffusion test (GDT). Semen was collected for bacterial culture at 7- to 8-day intervals and the scrotal contents were palpated to identify lesions of epididymitis. B. ovis was isolated from the semen of one ram on day 28, and by day 49 it was isolated from the semen of 10 rams. All 10 rams had suspicious or positive ELISA or CFT titres by day 36 and 56, respectively. The GDT results were all negative on day 36 and in general did not become positive in individual rams until 7-28 days after semen shedding commenced. Epididymitis was detected in one ram on day 36 and in eight rams by day 56.

**Comment:** When looking to confirm freedom of Brucellosis within a ram flock, following an eradication programme, current industry guidelines state that two negative CFT or ELISA tests, 60 days apart, are required. However, during the eradication phase, more frequent testing is desirable to identify infected rams as quickly as possible, thus minimising the spread of disease. This is especially important in commercial flocks as initial identification of the disease is often made during late summer, near the start of the breeding season, a time when transmission rates are at their highest. Also, as it is usually impractical to test during tupping time itself, the more whole-flock tests that can be arranged between the initial confirmation and the start of mating the better. So how frequently should we test? This study answers that very question. By artificially infecting a group of rams and then collecting serial blood and semen samples for eight weeks, the Massey University researchers identified the time range in which seroconversion occurred using CFT, ELISA and GDT tests. The results lead to a recommendation that, when undertaking a 'test and slaughter' campaign (using the ELISA test with or without the CFT) the optimum re-test interval is around four weeks. None of the infected rams tested positive with the GDT before day 36, indicating that this test is not helpful in such a programme. Interestingly, eight of the 10 positive rams (as confirmed by semen culture) had palpable epididymal lesions by the end of the 8-week study.

***Reference: N Z Vet J 2014;62(1):47–50***
Abstract

## Ramguard – Increasing the tolerance to facial eczema in New Zealand sheep

**Authors:** Amyes NC & Hawkes AD

**Summary:** The sheep industry in New Zealand has made steady progress towards increasing genetic tolerance to facial eczema by testing potential future sires in ram-breeding flocks with an artificial challenge of the mycotoxin, sporidesmin. Ramguard, a commercial service run by AgResearch, provides the sporidesmin to breeders to dose their sheep at a specified dose-rate, which is dependent on the level of tolerance already obtained. This article reviews the progress of Ramguard, which has operated since August 1988 and has 60 clients dosing a total of 800-1100 rams each year. Most of the long-term-testing flocks are now using a dose rate 6-fold higher than at the outset, indicating that the animals in these flocks are tolerant to all but the most severe outbreaks of facial eczema. The heritability estimate for resistance to facial eczema is high at 0.45±0.03.

**Comment:** The Ramguard service is one of the success stories of New Zealand animal health innovations. Operating commercially for nearly 30 years, the service provides sporidesmin (the toxin responsible for the liver damage that leads to facial eczema) to ram breeders who are then able to rank their animals in terms of facial eczema resistance. With heritability for this trait being quite high (around 0.45), those farmers who have been using the service for a while have demonstrated excellent progress, as evidenced by the fact that the dose rate of sporidesmin required to test their animals is six-times higher than at the outset of the scheme.

***Reference: Proceedings of the New Zealand Society of Animal Production 2014;74:154–57***
Abstract

## Prevalence and severity of anthelmintic resistance in ovine gastrointestinal nematodes in Australia (2009–2012)

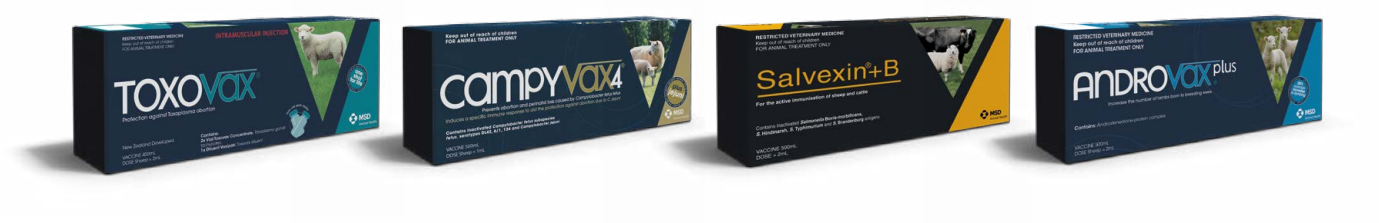
**Authors:** Playford MC et al.

**Summary:** The aim of this study was to assess the prevalence and severity of anthelmintic resistance (AR) in the Australian sheep industry by compiling the results of faecal worm egg count reduction tests (FECRTs) that conformed to Australian and New Zealand standard diagnostic procedures. Data were available from a total of 390 tests, with larval differentiation having been conducted in 222 cases. Pooled results from all Australian states for the macrocyclic lactone (ML) class showed a lower prevalence of AR against combined species for moxidectin (54%) compared with abamectin (77%) and ivermectin (87%). Analysis by state revealed higher levels of ML-resistant Teladorsagia sp. in Tasmania and Western Australia than in other states. ML-resistant Haemonchus sp. was more commonly detected in New South Wales.

**Comment:** Our big brothers across the ditch love any opportunity to demonstrate their superiority to us. And, when it comes to anthelmintic resistance (AR), they are certainly a few steps ahead of New Zealand! Their first reported case of AR was in 1966, to the BZ class, just 5 years after this anthelmintic was released. By 2011 an estimated 90% of Australian farms had BZ resistance. Similarly resistance to ivermectin was identified in Australia only about 5 years since this product was launched. This study, which was a collation of laboratory FECRT results, aimed to provide an up-to-date estimate of the resistance status of the various anthelmintic classes in Australia. The results make interesting reading; in summary, BZ resistance was found in 96% of FECRTs, abamectin resistance in 77% and moxidectin resistance in 54% of tests. The results are further broken down by nematode species (with Teladorsagia and Haemonchus being the main offenders, as expected) and region. Although it is acknowledged that AR in New Zealand is not as advanced as across the Tasman, the findings should be of interest to New Zealand vets and farmers and serve as extra incentive to follow best practice guidelines when it comes to anthelmintic usage and, indeed, parasite management in general.

***Reference: Aust Vet J 2014;92(12):464–71***
Abstract





## Efficacy of a buccal meloxicam formulation for pain relief in Merino lambs undergoing knife castration and tail docking in a randomised field trial

**Authors:** Small AH et al.

**Summary:** To assess the efficacy of oral transmucosal meloxicam for pain relief in lambs at marking, these investigators conducted a randomised, blinded, placebo-controlled block-design field study of 60 Merino lambs aged 7-10 weeks. The lambs were randomised to receive 1 mL/10 kg of drug vehicle (n=30) or meloxicam 1 mg/kg at 10 mg/mL administered into the buccal cavity immediately before knife castration and hot-iron tail docking. In the 8 hours following marking, meloxicam resulted in a 7-fold reduction (p<0.001) in combined abnormal behaviours (hunched standing, standing with a stretched posture, walking stiffly). Meloxicam-treated lambs spent substantially less time in standing postures and tended to spend more time grazing, suckling and in normal lying postures. At 24 hours, the meloxicam-treated lambs spent more time lying and less time standing.

**Comment:** The use of analgesics in lambs at docking and castration is not practised on commercial sheep farming operations in New Zealand. However, with ever increasing scrutiny of our routine farming practices from an animal welfare perspective, it is conceivable that this may be a requirement at some time in the future. This study looked at the efficacy of meloxicam in merino lambs, with treated lambs displaying significantly less pain-related behaviours on the day of docking than their untreated counterparts. The method of administration (1 mg/kg directly into the buccal cavity) is one that could conceivably be incorporated into a standard docking routine where speed and ease of use are important considerations. Perhaps of wider interest to New Zealand veterinarians is the demonstration that meloxicam appears to be effective in sheep in general. There are currently no NSAIDs licensed for use in sheep in this country. A recent American study concluded that the pharmacokinetic properties of the drug indicate that it should be a useful analgesic in this species. It is pleasing to see these findings supported by a study of its use in the field.

***Reference: Aust Vet J 2014;92(10):381–8***
Abstract

## Sero-prevalence and risk factors for leptospirosis in abattoir workers in New Zealand

**Authors:** Dreyfus A et al.

**Summary:** The aim of this study was to identify risk factors for sero-prevalence of leptospiral antibodies in abattoir workers. Sera were collected from 567 abattoir workers and tested by microscopic agglutination for Leptospira interrogans sv. Pomona and Leptospira borgpetersenii sv. Hardjobovis. The proportion of workers that had antibodies against Hardjobovis or/and Pomona was 11%. Average sero-prevalence in workers was 10-31% for four sheep abattoirs, 17-19% for two deer abattoirs, and 5% for two beef abattoirs. The strongest risk factor for sero-positivity in sheep and deer abattoirs was work position. In sheep abattoirs, prevalence was highest at stunning and hide removal, followed by removal of the bladder and kidneys. Wearing personal protective equipment, such as gloves and facemasks, did not appear to protect against infection.

**Comment:** Several studies have been carried out over the last decade or so looking to quantify the prevalence of leptospira infection in our drystock farms. All came to the same conclusion; finding an uninfected herd or flock is very difficult! Almost all of our sheep flocks and beef herds have evidence of infection, as do about 80% of the country's deer herds. The findings of this study should therefore come as no surprise. The large scale survey of over 560 abattoir workers across four sheep, two deer, and two beef plants revealed that 11% had antibodies to leptospirosis. Prevalence varies between plants and ranges from an average seroprevalence of 5% for the beef plants to 31% for the highest sheep plant. The two deer plants sat at 17 and 19%. Worryingly, the use of protective clothing, including face masks, did not appear to reduce the risk of infection. It is about 30 years since the threat of leptospirosis in abattoir workers lead to widespread vaccination in the New Zealand pig industry. How far away is the red meat sector?

***Reference: Int J Environ Res Public Health 2014;11(2):1756–75***
Abstract

## Analysis of individual farm investigations into bovine viral diarrhoea in beef herds in the North Island of New Zealand

**Authors:** Cuttance WG & Cuttance EL

**Summary:** These researchers combined data from 43 individual farm investigations of herd bovine viral diarrhoea (BVD) status and risk factors to estimate the prevalence of recent active BVD virus (BVDV) infection in beef herds in the Waikato, King Country, Wairoa, and Gisborne areas of New Zealand. Each investigation involved collecting blood samples from 10 to 15 rising 2-year-old replacement heifers (n=637) to test for individual antibodies to BVDV using ELISA and a risk assessment questionnaire was completed to collect information about farm management practices and farmer attitudes. Of the 43 herds, 25 (58%, 95%CI 43-71) had evidence of recent active BVDV infection. The percentage of affected herds did not differ between the four areas (55-67%; p=0.87). The following factors were significantly associated with increased odds of active infection: increasing numbers of heifers on the farm, introducing replacement heifers, and the farmer considering BVD was an issue on the farm. In contrast, vaccinating introduced breeding bulls was associated with decreased odds of BVDV infection.

**Comment:** Encouraging a beef farmer client to undertake a BVD control programme is usually challenging for veterinarians in this country. Not surprisingly, farmers are much more likely to adopt a new strategy if an economic benefit can be demonstrated and, when it comes to BVD in beef herds, such evidence is pretty scant. Huer et al., in 2008, estimated that there was a 5% reduction of pregnancy rates in BVD infected herds, but no-one has attempted to quantify the economic losses associated with the presence of transiently infected animals amongst non-breeding cattle. This paper describes the initiative of one large veterinary practice with branches in four of the important beef farming regions in the North Island. The project involved an attempt to quantify the prevalence of BVD in their clients' beef herds through serological testing as well as identifying farm management factors associated with infection. The authors found that nearly 60% of participating farms had evidence of recent infection and identified several factors that either increased or decreased the risk. It was felt that, following the project, the clients of the practice involved should now have greater confidence in the need to manage BVD on their properties.

***Reference: N Z Vet J 2014;62(6):338–42***
Abstract

## Pregnancy rates of beef cattle are not affected by Campylobacter fetus subsp. venerealis real-time PCR-positive breeding sires in New Zealand

**Authors:** Sanhueza JM et al.

**Summary:** Concerns about the specificity of a commercial real-time polymerase chain reaction (PCR) assay used to identify the DNA of Campylobacter fetus subspecies venerealis in bulls led to this study being undertaken to assess the association between real-time PCR assay results from beef breeding bulls and pregnancy rates in beef herds using these bulls. Veterinarians from four veterinary practices selected beef cattle herds with relatively high and low pregnancy rates and preputial scrapings were collected from bulls used for mating in those herds. The samples were then tested using the real-time PCR assay under consideration. Sixty-four (28.8%) of 222 bulls tested positive, 130 (58.6%) tested negative, and 28 (12.6%) returned an inconclusive result to the real-time PCR assay. The percentage of bulls testing real-time PCR-positive in these mobs was not associated with pregnancy rates (p=0.757) after controlling for multiple factors.

**Comment:** Bovine genital campylobacteriosis is a disease caused by C. fetus venerealis, and is characterised by reproductive wastage in heifers and cows due to conception failure or early embryonic death. The organism was last isolated in New Zealand in 1993. It is very difficult to isolate from samples collected in the field, which led to the need to develop an alternative diagnostic test. Such a test (a real-time PCR test performed on bull preputial scrapings) was developed in Australia and became commercially available in New Zealand in 2007. Concerns were raised about the test's specificity, however, after anecdotal reports that the frequency of positive tests observed from bulls did not seem to be related to reproductive wastage in the beef herds involved. However, because the test was, naturally, used in herds with poor reproductive performance such suspicion was hard to prove. This paper describes a study whereby both high- and low-reproductive performance herds where chosen and the test in question was applied to the bulls used in those herds. The study concluded that there was no relationship between the percentage of test-positive bulls in a particular mating mob and the pregnancy rate in that group, leading to a recommendation that this real-time PCR test should not be used in New Zealand. Consequently, it is no longer offered by diagnostic laboratories in this country.

***Reference: N Z Vet J 2014;62(5):237–43***
Abstract