APRIL 2022

Sheep reproduction RD&A alert

This sheep reproduction RD&A alert is an initiative of the Sheep Reproduction Strategic Partnership (SRSP).

The recording of the SRSP webinar **How to profit from pregnancy scanning** is now available to view from the SRSP website.
Part 1: *Can you afford not to scan?* was presented by John Young (Farming Systems Analysis Service) who discussed the results of an economic analysis of the profitability of pregnancy scanning.
Part 2: *Set your scanning up for success* was presented by Josh Cousins (Cousins Merino Services) provided a pregnancy scanners perspective on best practice preparation for scanning for set you scanner up to ensure high accuracy.

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The SRSP aims to help sheep producers to profitability and sustainably increase lamb production through increasing lamb survival and weaning rates and will coordinate a national approach to improving sheep reproductive performance.

Feature project

The impact of shade and shelter on sheep reproduction and welfare

Heat stress on ewes and rams can reduce fertility and influence foetal development and lamb survival. Likewise, cold stress will reduce the survival of newly shorn sheep and newborn lambs. Extreme climatic variation (wind, rain and temperature) poses significant stress on extensively managed sheep. Shade and shelter offer the opportunity to minimise stress to improve the production and welfare of sheep.

The SRSP, in collaboration with the University of Western Australia, Murdoch University, NSW DPI and CSIRO, has two new projects that will investigate and develop interventions to reduce the impact of climatic variation on sheep enterprises.

Investigating heat stress in ewes

Project aim

To quantify the effects of heat events on sheep reproduction, thermoregulatory capacity, behaviour and wellbeing through long term data collection during a range of climatic conditions in diverse production settings

Design, establishment and benefits of edible shelter to improve lamb survival and whole-farm profitability

Project aim

To investigate the impacts of different types of edible shelter on the physiology, behaviour, welfare and survival of sheep, along with the nutritional benefits of the feedbase in mixed farming enterprises.

These projects will incorporate a range of activities from surveys to workshops, on-farm research and systems modelling.

More information on the shade and shelter project can be found on the SRSP website.

Scientific papers

Effects of heavier live weight of ewe lambs at mating on fertility, lambing percentage, subsequent live weight and the performance of their progeny

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New Zealand Journal of Agricultural Research, Volume 65 (2-3), April 2022

DOI https://doi.org/10.1080/00288233.2020.1840399

Abstract

Ewe lamb live weight at first mating (7 months of age) is positively associated with reproductive performance and led to the recommendation of a minimum mating live weight of 40 kg. This experiment examined the effects of heavier mating live weight of ewe lambs on their live weight, fertility, lambing percentage and their progeny performance to weaning. Ewe lambs (n = 270) were randomly allocated to one of two treatments. The Heavy group (n = 135) was preferentially fed until mating, achieving 47.9 ± 0.36 kg, while the Control group (n = 135) had an average mating live weight of 44.9 ± 0.49 kg. Fertility, lambing percentage, ewe live weights, the survival and live weights of their progeny were recorded. There was a 28% increase in fertility and a 59% increase in lambing percentage in the Heavy group compared to the Control group. Progeny survival and live weights did not differ (P > .05) by treatment. A curvilinear relationship between fertility and ewe live weight at mating was identified, suggesting that ewe lambs should be mated at a live weight of 50–55 kg to maximise fertility and lambing percentage without reducing ewe live weight nor the progeny performance.

Breeding heavier ewe lambs at seven months of age did not impact their subsequent two and three-year-old ewe live weight and reproductive performance

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New Zealand Journal of Agricultural Research, Volume 65 (2-3), April 2022

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Abstract

The current study investigated the effects of growing ewe lambs to a heavier live weight at breeding on their subsequent reproductive performance and live weight at two and three years of age, and the growth of their progeny to weaning. Two groups of ewe lambs were bred at seven months of age at an average pre-breeding live weight of either 47.9 ± 0.36 kg (Heavy; n = 135) or 44.9 ± 0.49 kg (Control; n = 135). Breeding performance, fertility, litter size, lambing percentage, ewe wither height, live weight, progeny survival, and live weight were recorded at two and three years of age. None of the variables measured differed between the Heavy and Control ewes at either two or three years of age (P > 0.10). This suggests that farmers can breed their Romney-type ewe lambs at an average live weight of 48 kg without any negative impacts on reproductive performance at two or three years of age nor on their progeny's live weight or growth to weaning. Although breeding heavier ewe lambs improved reproductive performance during their first year, further investigations are needed to assess their overall lamb production and efficiency over multiple breeding seasons.

The effect of a fodder beet versus rye-grass grazing regime during mid-to-late gestation twin-bearing ewes on dam and progeny performance and lamb survival

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New Zealand Journal of Agricultural Research, Volume 65 (2-3), April 2022 **OPEN ACCESS**

DOI https://doi.org/10.1080/00288233.2021.1879175

Abstract

The objective was to determine the effect of grazing fodder beet versus ryegrass-dominant pasture from mid-to-late gestation on dam and offspring performance under practical farming conditions. Twin-bearing ewes were randomly allocated to grazing regimes of either fodder beet plus ad libitum ryegrass/clover hay (FB; n = 100) or ryegrass-dominant pasture plus ad libitum ryegrass/clover hay (RG; n = 100) with three replicates per group, from pregnancy day (P) 100–110 to birth. At P135, 10 ewes per treatment were randomly selected from each replicate, slaughtered and back fat and eye muscle depth and fetal body weight and composition were measured. Samples were evaluated for selected blood metabolites. Ewe BW and BCS change and lamb growth were measured, and lamb survival from birth to weaning calculated. Compared with RG, FB ewes had lower ADG and overall lower BCS resulting from increased mobilisation of both fat and muscle. Lambs born to FB-ewes had lower BW and postnatal growth rates and increased mortality from birth to weaning (29% versus 12%). Body composition and blood parameters indicated that FB compared to RG ewes were subject to undernutrition. This study provides new insights into the consequences of FB grazing regimes, as an alternative to ryegrass pasture, on animal performance.

Defects and bacterial pathogens in udders of non-dairy breed ewes from New Zealand

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Abstract

The objectives of this study were to identify the prevalence, incidence and range of udder defects in non-dairy breed ewes in New Zealand and to investigate the range of bacteria present in milk samples. The udders of 5700 mixed-age ewes on 11 sheep farms in the lower North Island of New Zealand were examined and scored at weaning. The majority were examined again 4–6 weeks later. Milk samples were aseptically collected from 110 ewes (195 udder halves) for bacterial culture. At the initial (weaning visit), 2.5% of ewes had udder defects, while 4–6 weeks later, an additional 2.4% of the remaining ewes had developed defects in the intervening period. In total, across the two visits, 4.5% of ewes were identified with udder defects (inter-farm range 2–7%). The most commonly identified defects were lumps in one udder half, followed by diffuse hardness in one udder half. A range of bacterial species were isolated from milk samples but Staphylococcus aureus was the most common species. These results demonstrate that udder defects are common in ewes in New Zealand, and farmers are recommended to examine ewes' udders at least 4–6 weeks after weaning so that defective ewes are not bred.

Production responses in adult ewes to long-acting anthelmintic treatment pre-mating: relationship with body condition score

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Abstract

A trial was conducted to investigate the response of mixed age ewes of different body condition scores (BCS) to a pre-mating treatment with long-acting anthelmintics. Three hundred Poll–Dorset Texel cross ewes were divided into three groups of 100 and treated pre-mating with either a 100-day controlled-release capsule containing abamectin, albendazole, selenium and cobalt, a long-acting injectable formulation of moxidectin or remained untreated. Initially, ewes of lower BCS showed a significantly larger response in liveweight gain and a BCS increase which approached significance. However, these benefits did not persist following the expiry of the anthelmintics. Although treated ewes gave birth to more lambs, by weaning there was no significant difference between treatment groups in any of the measured variables and no significant influence of ewe BCS at treatment. The results are similar to earlier studies which showed that the benefits measured at the end of a long-acting anthelmintic treatment may not persist and may over-estimate the true benefit. Although there was a temporary benefit to treatment of low BCS ewes the data in general supports the view that many factors contribute to low BCS in ewes and parasites are often only a minor contributor.

Melatonin dose: testicular and testosterone response in Border Leicester rams during spring

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Livestock Science, 12 April 2022, *In Press*

DOI https://doi.org/10.1016/j.livsci.2022.104928

Highlights

- Border Leicester rams were administered different doses of melatonin prior to joining in spring.
- Melatonin maximised testicular growth at the 36 to 54 mg implant doses.
- Testosterone was positively related to plasma melatonin levels at days 60 and 90 post treatment.
- Plasma melatonin levels were negatively related to live weight at day 30.

Abstract

The negative effects of seasonality on ram fertility during the spring months (non-breeding season) can be addressed by administration of melatonin. Slow-release implants containing 18 mg of melatonin are available to improve reproductive responses in ewes but as far as we are aware nobody has examined the effects of dose on increase testicular size and plasma testosterone levels. Mature Border Leicester rams were randomly allocated to four doses (0, 18, 36 and 54 mg) with treatment beginning in mid-September (spring). Measurements (scrotal size, testosterone and melatonin concentrations, live weight and body condition score) began before hormone administration and continued at monthly intervals until January (mid-summer). Scrotal circumference increased with increasing dose with 36 and 54 mg treatments producing larger responses than 0 and 18 mg treatments ($p < 0.05$). Plasma testosterone concentration was positively related ($p \leq 0.05$) with plasma melatonin levels on days 60 and 90 after melatonin administration. There was a negative relationship ($p < 0.01$) between plasma melatonin concentration and liveweight on day 30. It is concluded that a higher dose of melatonin is required to maintain plasma melatonin levels in larger animals, and that at least 36 mg is required to elicit a threshold response in testicular size.

Breed and crossbreeding effects on growth, fitness and reproduction of commercial sheep in South Africa

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Small Ruminant Research, 27 April 2022, *In Press*

DOI https://doi.org/10.1016/j.smallrumres.2022.106705

Highlights

- Dorper and South African Mutton Merino (SAMM) sheep were studied in a 2 ×2 diallel crossbreeding experiment.
- No additive breed effects were evident for lamb growth, ewe reproduction or total tick count.
- Direct heterosis was detected for weaning weight (7.1%), number of lambs weaned (32.5%) and total weight of lamb weaned (38.4%).
- Dam breed affected birth weight (4.5%), but not any of the other traits studied.
- Crossbreeding of a meat with a dual-purpose breed may result in benefits in commercial sheep production.

Abstract

The study aimed to assess additive breed effects for growth (birth, weaning and ewe adult weight), fitness (lamb survival and tick count under natural challenge) and ewe reproduction traits per ewe mated in Dorpers, the most common meat breed in South Africa (SA), and the SA Mutton Merino (SAMM) a prominent dual-purpose breed in SA extensive environments. Additionally, the reciprocal crosses between the two breeds were used to estimate dam breed effects and heterosis. No conclusive additive breed differences were found for lamb weight traits, lamb survival or tick counts. There was a suggestion that lamb survival of Dorpers was higher than that of their SAMM contemporaries, but significance could not be demonstrated. Crossbred progeny outperformed the midparent value by 7.1% for weaning weight. As far as mature ewes were concerned, mating weight was affected by breed combination with the mating weights of purebred SAMM ewes as well as crossbred ewes exceeding that of purebred Dorpers. Number of lambs born per ewe lambed was independent of the genetic group. The SAMM x Dorper group outperformed the pure breeds for number of lambs weaned per ewe mated (NLW). Contrasts for additive breed and maternal heterosis were not significant for NLW, but direct heterosis amounted to 32.5%. Crossbred ewes performed better than the pure breeds for total weight of lamb weaned per ewe lambed, direct heterosis amounting to 38.4%. The other contrasts were not significant. A lack of additive effects for traits, barring ewe mating weight suggested that the breeds performed similarly under the conditions of the study. Significant heterosis effects for weaning weight as well as number and weight of lamb weaned suggest a role for crosses between Dorpers and SAMMs in commercial lamb production enterprises.

Upcoming events

Date	Event	Location
6 May 2022	Optimising reproductive rates in pastoral sheep flocks Western Local Lands Services	Oxley, NSW
12 May 2022	Managing the growth of ewe weaners Western LLS, MLA PDS & Elders	Hillston, NSW
3 May 2022	Wool & Lamb: good times ahead? Leading Sheep	Webinar

2 June 2022	New England 2022 MLP Field Day AWI, AMSEA, CSIRO	Uralla, NSW
7 June 2022	Livestock Forum PIRSA, Sheep Connect SA, MLA, AWI	Snowtown, SA
8 June 2022	Livestock Forum PIRSA, Sheep Connect SA, MLA, AWI	Orrorroo, SA
9 June 2022	Livestock Forum PIRSA, Sheep Connect SA, MLA, AWI	Wudinna, SA

Funding calls

Program	Open	Close
Producer Demonstration Sites Meat & Livestock Australia	1 April 2022	13 May 2022