

MAY 2022

Sheep reproduction RD&A alert

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

Mid-pregnancy shearing can increase the birthweights of multiple lambs, increase lamb survival by 3-5% and reduce ewe deaths due to casting – but good post-shearing nutrition is critical. This was the key message delivered by Professor Paul Kenyon (Massey University) via a [beef+lamb New Zealand Science + herd podcast](#). Large farm-scales studies in New Zealand have shown that mid-pregnancy shearing (between 50-100 days) can be a valuable tool to improve foetal growth in twin and triplet lambs so they are born within the optimal birthweight range. This in turn enhances lamb survival, but this survival response will only occur if the ewe is well fed and has body reserves available- so a minimum Body Condition Score of 2.5. This also builds a case for not shearing lighter condition ewes at mid-pregnancy.

Program coordinator

Dr Sue Hatcher

M: 0407 006 454

E: sue@makinoutcomes.com.au

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 update

Fit to join

Maximising ewe and lamb survival and health during lambing is a high priority for the sheep industry to address both animal welfare and productivity imperatives. To date most RD&A has focused on improving ewe nutrition during pregnancy and management during lambing to weaning. However, there is an untapped opportunity to improve lamb survival outcomes through more rigorous ewe assessment and selection before joining.

Project aim

To develop a series of producer ewe assessment tools to aid the selection process prior to joining. These tools will include selection and management criteria for ewe lambs through to older ewes and will accommodate factors that hamper ewes' capacity to rear a lamb such as udder health and lameness.

Project objectives

1. Conduct an in-depth literature review on existing best practice guidelines of ewe selection processes.
2. Complete and report on a minimum of three (a minimum of one Merino and one maternal prime lamb flock) producer case studies quantifying the impact of improved pre-joining ewe selection practices.
3. Develop short (< 7 minute) videos on pre-joining ewe assessment processes and a ewe selection ute guide for sheep producers covering fitness to join and the management implications for high risk ewes.

Current progress

Case studies have been conducted on commercial farms tracking ewes classed pre-joining through their reproductive cycle to trial and evaluate the reproductive performance outcomes for producers trialling an enhanced ewe selection process. These case studies have validated the recommendations with their collected data used in benefit cost analyses. The videos and ewe selection guidelines will complement existing sheep reproduction extension activities (i.e. Lifetime Ewe Management, BredWell FedWell and Picking Performer Ewes) and be available in coming months.

For more information on the fit to join project, please contact Melanie Smith (msmith@mmla.com.au)

Review paper

Estrogenic pastures: a source of endocrine disruption in sheep reproduction

Kelsey Pool (kelsey.pool@uwa.edu.au), Faustine Chazal, Jeremy Smith and Dominique Blache

Frontiers in Endocrinology, Volume 13, 28 April 2022 **OPEN ACCESS**

DOI <https://doi.org/10.3389/fendo.2022.880861>

Abstract

Phytoestrogens can impact on reproductive health due to their structural similarity to estradiol. Initially identified in sheep consuming estrogenic pasture, phytoestrogens are known to influence reproductive capacity in numerous species. Estrogenic pastures continue to persist in sheep production systems, yet there has been little headway in our understanding of the underlying mechanisms that link phytoestrogens with compromised reproduction in sheep. Here we review the known and postulated actions of phytoestrogens on reproduction, with particular focus on competitive binding with nuclear and non-nuclear estrogen receptors, modifications to the epigenome, and the downstream impacts on normal physiological function. The review examines the evidence that phytoestrogens cause reproductive dysfunction in both the sexes, and that outcomes depend on the developmental period when an individual is exposed to phytoestrogen.

Scientific papers

Using pen-side measurable blood parameters to predict or identify dystocic lambing events

Amellia Redfearn, Jody McNally, Heather Brewer, Emma Doyle and Sabine Schmoelzl

(sabine.schmoelzl@csiro.au)

Biology (Basel), Volume 11(2), February 2022 **OPEN ACCESS**

DOI <https://doi.org/10.3390/biology11020206>

Simple Summary

Prolonged or non-progressive labour is the greatest risk factor for loss of newborn lambs in Australia and poses significant welfare and economic concerns worldwide. In this study, we set out to investigate whether pen-side technology could be used to predict which ewes would be at risk of prolonged labour. In our pilot trial, we found potentially useful markers. We next developed a sampling protocol by looking at changes in candidate markers over time in normal lambing events. Finally, we searched for blood markers that could distinguish between normal and difficult lambing events, sampling pre-birth (estimated one week before birth), at birth (within 3 h) and post-birth (16–26 h). Possible predictors of lambing difficulty were chloride, haematocrit and haemoglobin, sampled one week before birth; creatinine, sampled at birth; and acid–base related parameters after birth. In conclusion, we found that pen-side analysis of blood markers showed

promise in identifying dystocic lambing events. More information is required to decide whether pen-side diagnostics could be useful to identify and predict dystocic lambing in the future.

Abstract

Dystocia is the greatest contributor to neonatal lamb mortality in Australia and poses significant welfare and economic concerns worldwide. In this study, we set out to investigate whether pen-side analysis technology could be employed to detect blood parameters predictive of dystocic labour events in sheep. In a pilot trial, we collected and analysed blood samples in pen-side assays for glucose, lactate, pH, pCO₂, pO₂, base excess, HCO₃⁻, TCO₂, sO₂, lactate, sodium, potassium, chloride, calcium, urea nitrogen, creatinine, haematocrit, haemoglobin and anion gap. From the pilot data, we identified creatinine, TCO₂, chloride and calcium as potentially useful markers. To develop a time course and to establish variability of the selected blood parameters, a time series of samples was collected from 12 ewes, from mid-gestation to 48 h after birth. For the main trial, blood samples were collected at mid- and late gestation for glucose determination and for the full set of blood parameters at three time points before, at and after birth. Possible predictors of lambing difficulty were chloride, haematocrit and haemoglobin, sampled one week before birth; creatinine, sampled at birth; and blood pH and base excess after birth. In conclusion, we found that pen-side analysis of blood markers showed promise in identifying dystocic lambing events.

Performance and behavior of the progeny of ewes fed with different sources and energy feed

Fernanda Ferreira dos Santos, Luciano Brochine, Mariluce Cardoso Oliveira, Guilherme Augusto Ferigato, Vanderlei Benetel Junior, Cristiane Gonçalves Titto, Paulo Roberto Leme and Sarita Bonagurio Gallo (saritabgallo@usp.br)

Livestock Science, Volume 260, June 2022

DOI <https://doi.org/10.1016/j.livsci.2022.104953>

Highlights

- Diets with low energy levels can decrease body weight, body condition score, and Famacha[®] score in lactating ewes.
- Adding rumen-protected fats to the ewe's diet has a beneficial effect on body condition score variation after lambing.
- Adding chromium propionate to the mother's diet has positive effects on the ewe lambs' body weight.
- Diets with low energy levels may harm mother-lamb behavior.

Abstract

This study aimed to investigate the effects of increased dietary energy intake and different feeds (starch, calcium salts of palm oil, and chromium propionate) in the nutrition of ewes, at gestation and lactation, evaluating the effects on the progeny. Seventy-two Dorper x Santa Inês ewes were allocated in a completely randomized block design, in five treatments. CTL (n=14) with 100% of predicted ME requirement, LOW (n=14) with 90% of predicted ME requirement, ST (n=15) with 110% of predicted ME requirement, and the energy source was starch, ST+Cr (n=15) treatment ST more chromium propionate, and ST+PF (n=14) treatment ST more calcium salts of palm oil. The data were evaluated by the Tukey test, at 5% significance, and behavior analyses by Kruskal-Wallis at 10% significance. Energy levels influenced ewes to body weight (BW), body condition score (BCS), and Famacha[®] score before and after lambing and during lactation, being that the use of calcium salts of palm oil had greater benefits. Although the dam's diet did not influence the offspring's weight gain, body measurements, BCS, and Famacha[®] at 260 days old. ST+Cr produced heavier offspring. A lower energy diet negatively influenced the degree of Famacha[®] on ewes and offspring and mother-lamb behavior. This work showed that diets with 10% less metabolizable energy resulted in ewes with lower body

weight and body condition scores during pregnancy and lactation, and the progeny had lower body condition weight. The type of feed affects maternal filial behavior and fetal programming.

Effects of implanting exogenous melatonin 40 days before lambing on milk and colostrum quality

Francisco Canto, Eloi González and José Alfonso Abecia (alf@unizar.es)

Animals, Volume 12(10), May-2 2022 **OPEN ACCESS**

DOI <https://doi.org/10.3390/ani12101257>

Simple Summary

Colostrum is the first product produced by mammals in the mammary gland immediately after parturition. It contains immunoglobulins, which are essential for the survival of the newborn. Because some evidence exists of a positive effect of melatonin on colostrum quality in sheep, we studied the effect of implanting melatonin 6 weeks before lambing in five dairy farms, and simultaneously on milk yield and quality during the first three monthly milk samplings after lambing. We compared one vs. two implants, and a control, nonimplanted group. Ewes that received a melatonin implant 40 d before lambing produced colostrum that had a higher IgG concentration than the colostrum from nonimplanted ewes, and produced more milk which, had a lower somatic cell count (SCC). The effect on SCC was prolonged if the sheep received a second melatonin implant.

Abstract

The effects of exogenous melatonin implanted before lambing on the quality of colostrum and milk yield were quantified in 715 ewes. Forty days before lambing, 246 ewes (1M) received a melatonin implant; another 137 ewes (2M) received two implants, and the remaining 332 ewes (C) did not receive an implant (control). Milk analysis was based on individual monthly milk samplings (June, July, and August) after lambing. A colostrum sample was collected from 303 ewes (118 1M; 73 2M; and 112 C), and IgG concentrations were measured. Ewes implanted with melatonin had higher ($p < 0.01$) daily milk yield (DMY) in the three samplings than the C ewes. On average, 1M ewes produced more milk ($p < 0.05$) than ewes in the other two groups, and 2M ewes produced significantly ($p < 0.05$) more milk than C ewes. In the first and third controls, ewes that received two melatonin implants had a lower ($p < 0.05$) SCC than C and 1M ewes, and in the second sampling, 1M and 2M ewes had a lower ($p < 0.01$) SCC than C ewes. Ewes that received melatonin implants had a higher ($p < 0.01$) IgG concentration (21.61 ± 1.03 mg/mL) than non-implanted ewes (16.99 ± 1.13 mg/mL); 2M ewes had the highest IgG levels. In conclusion, ewes that received a melatonin implant 40 d before lambing produced colostrum that had a higher IgG concentration than the colostrum from nonimplanted ewes, and produced more milk, which had a lower SCC. The effect on SCC was prolonged if the sheep received a second melatonin implant.

Upcoming events

Date	Event	Location
31 May 2022	Managing the growth of ewe weaners Western LLS & MLA	Hillston, NSW
2 June 2022	New England 2022 MLP Field Day AWI, AMSEA, CSIRO	Uralla, NSW
6- 8 June 2022	MerinoLink Conference 2022 MerinoLink	Wagga Wagga, NSW
7 June 2022	Livestock Forum	Snowtown, SA

8 June 2022	PIRSA, Sheep Connect SA, MLA, AWI Livestock Forum	Orrorroo, SA
9 June 2022	PIRSA, Sheep Connect SA, MLA, AWI Livestock Forum	Wudinna, SA
14 June 2022	PIRSA, Sheep Connect SA, MLA, AWI Sheep Production Workshop	White Cliffs, NSW
16 June 2022	Western LLS, Farm Business Resilience Program BestWool/BestLamb & BetterBeef Conference	North Bendigo, Vic
21 June 2022	Agriculture Victoria Optimising reproductive rates in pastoral sheep flocks – workshop	Cobar, NSW
28 June 2022	NSW Local Land Services & MLA Optimising your ewe lamb joining	Wagga Wagga, NSW
29 June 2022	MLA, Murdoch University, neXtgen Agri Optimising your ewe lamb joining	Dunkeld, Vic
30 June 2022	MLA, Murdoch University, neXtgen Agri Optimising your ewe lamb joining	Naracoorte, SA
1 July 2022	MLA, Murdoch University, neXtgen Agri Profitable weaners Elders	Mildura, SA