JANUARY 2022

Sheep reproduction RD&A alert

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

The impact of heat stress on sheep reproduction is the subject of a new project led by Dr Serina Hancock (Murdoch University) with collaborators from UWA, CSIRO, NSW DPI and LLS NSW. Serina is seeking baseline information on the current use of shelter and shade by sheep producers and the factors that motivate producers to establish shelter on their properties. The seven-question-survey take should take less than five minutes to complete. Please complete the shelter and shade survey and contribute to this important research for the sheep industry.

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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.

Scientific papers

Impact of focus feeding on reproductive losses, prolificacy, or fecundity of estrous synchronized ewes

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Livestock Science, Volume 256, February 2022

DOI https://doi.org/10.1016/j.livsci.2021.104817

Highlights

- Focus feeding after a synchronized service does not increase the reproductive losses in ewes.
- The supplementation before the review service does not increase the prolificacy or fecundity of the ewes.
- The increase in plasma urea concentrations does not correlate with reproductive losses in ewes.

Abstract

The aim of this study was to evaluate the impact of a focus feeding (energy-protein supplementation) after a fixed timed artificial insemination (TAI) and before the review service, on reproductive and metabolic variables. Multiparous Merino ewes (312) from a commercial flock (-30° 44´ S; -57°39´ W) grazing native pastures were synchronized with progestogens devices for 12 days (Days -14 to -2) and eCG at removal and cervical TAI (Day=0). On Day 7 post-TAI the ovulation rate (OR) was estimated, and two groups were formed: Supplemented (S; n=155) and Control (C; n=157). The S group was supplemented with soybean meal (1.2% of body weight) between Days 8 and 14. The review service was carried out between Days 14 and 21 using 2.5% fertile chest painted rams and the non-service return rate on Day 21 (NR-D21) calculated. Blood samples

were obtained from 25 ewes of each group on Days 8, 12, 14, and 17 to evaluate no esterified fatty acid (NEFA) and urea plasma concentrations. On Day 26 OR was evaluated on the ewes with review service. Embryo losses, fertility, prolificacy, and fecundity of both services were estimated on Day 60 by transabdominal ultrasonography. No significant differences were observed in NR-D21 (65.8 vs. 63.7%), fertility (62.4 vs. 64.5%), prolificacy (1.32±0.75 vs. 1.33±0.76), fecundity (85.2 vs. 82.8%), or embryo losses from TAI service, or OR (1.16±0.37 vs. 1.15±0.36), fertility (87.7 vs. 92.4%), prolificacy (1.00±0.0 vs. 1.02±0.14) or fecundity (87.7 vs. 90.6%) of the review service for S and C groups respectively ($P > 0.05$). The urea concentrations increased significantly between Days 12 and 14 in S group ($P < 0.05$), and the NEFA concentration decreased faster with supplementation in the S group ($P > 0.05$). We concluded that a high energy-protein supplementation before the review service does not increases the reproductive losses from TAI, neither prolificacy nor fecundity of the review service.

Melatonin treatment during late gestation of undernourished ewes: lamb body temperature and mother–young behaviours after birth

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Animal Production Science, Volume 62(2), 4 January 2022

DOI https://doi.org/10.1071/AN21016

Abstract

Context: In extensive grazing sheep systems, pregnant ewes undergo periods of undernutrition because gestation coincides with winter when natural pasture is of lowest quantity and poorest quality. The lamb's weight and thermoregulatory capacity, and the ewe–lamb bond at birth, may be compromised. Maternal melatonin treatment during gestation may reverse these effects.

Aim: The aim was to determine the effects of melatonin treatment of single-lambing, undernourished ewes during the last third of gestation on lamb birthweights and body temperatures, and on ewe–lamb interactive behaviour after birth.

Methods: At Day 100 of gestation, 39 single-bearing ewes received a subcutaneous melatonin implant, and 54 ewes served as controls with no implant. Throughout gestation, the ewes remained under extensive conditions grazing on natural pasture. Measurements were made of lamb birthweight, body temperatures (surface temperature by infrared thermography and rectal temperature), and ewe–lamb behaviours during a handling test at 6–17 h after lambing.

Key results: There was no effect of melatonin treatment on lamb birthweight or rectal temperature, or on ewe–lamb interaction behaviours. Hip minimum surface temperature was greater in lambs from melatonin-treated ewes than lambs from control ewes (21.2°C ± 0.9°C vs 18.8°C ± 0.8°C; $P = 0.05$), and there was a similar trend for hip mean surface temperature (24.6°C ± 0.9°C vs 22.3°C ± 0.7°C; $P = 0.06$). Rump surface temperatures were greater in male than female lambs: maximum (27.9°C ± 1.2°C vs 22.9°C ± 1.2°C; $P = 0.01$), minimum (22.2°C ± 1.5°C vs 16.7°C ± 1.5°C; $P = 0.02$) and mean (25.4°C ± 1.3°C vs 20.5°C ± 1.3°C; $P = 0.02$).

Conclusion: Melatonin treatment during the last third of ewe pregnancy slightly enhanced the surface temperature of lambs at birth but did not influence ewe–lamb interaction behaviour after birth (i.e. after establishment of the ewe–lamb bond).

Implications: Further study in more depth is warranted into the possible effects of maternal supplementation with commercial melatonin implants on lamb development, thermoregulatory capacity, behaviour and survival rates in extensive grazing systems, including the effect on ewe–lamb behaviours immediately after birth for both singletons and twins.

Abortion and lamb mortality between pregnancy scanning and lamb marking for maiden Eewes in southern Australia

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Animals, Volume 12(1), January 2022 **OPEN ACCESS**

DOI https://doi.org/10.3390/ani12010010

Simple Summary

The reproductive efficiency of ewes in their first breeding season (maiden ewes) can be inconsistent and disappointing. The frequency of abortion and its relative contribution to lamb losses in maiden ewe flocks in Australia has not been well studied. This study measured abortion and lamb mortality occurring between pregnancy diagnosis (scanning) and lamb marking in 30 flocks of maiden ewes on Australian sheep farms. The study included flocks of ewe lambs that had lambed for the first time at approximately one-year-old (n = 19) and two-tooth ewes that had lambed for the first time at two-years-old (n = 11). Abortion was detected in 14/19 flocks of ewe lambs and 6/11 flocks of two-tooth ewes using repeated scans. On average 5.7% of ewe lambs and 0.9% of two-tooth ewes aborted; however, abortion rates between flocks ranged from 0–50% for ewe lambs and 0–4.4% for two-tooth ewes. Lamb mortality from birth to marking represented the greatest contributor to overall lamb mortality occurring after pregnancy scanning but abortions were an important contributor to the overall losses in some ewe lamb flocks. This study highlights the variability in reproductive performance for maiden ewes and indicates that addressing losses due to abortion may improve reproductive performance in some ewe lamb flocks.

Abstract

The contribution of abortions to the overall mortality of lambs born to maiden (primiparous) ewes in Australia remains unclear. This cohort study aimed to quantify abortion and lamb mortality for ewe lambs and maiden Merino two-tooth ewes. Lamb mortality from pregnancy scanning to marking were determined for 19 ewe lamb and 11 Merino two-tooth ewe flocks across southern Australia. Average lamb mortality from scanning to marking was 35.8% (range 14.3–71.1%) for the ewe lambs and 29.4% (range 19.7–52.7%) for the two-tooth ewes. Mid-pregnancy abortion was detected in 5.7% of ewes (range 0–50%) in the ewe lamb flocks and 0.9% of ewes (range 0–4.4%) in the two-tooth ewe flocks. Mid-pregnancy abortion affecting ≥2% of ewes was observed in 6/19 ewe lamb flocks and 2/11 two-tooth ewe flocks. Lamb mortality from birth to marking represented the greatest contributor to foetal and lamb mortality after scanning, but mid-pregnancy abortion was an important contributor to lamb mortality in some ewe lamb flocks. Variability between the flocks indicates scope to improve the overall reproductive performance for maiden ewes by reducing foetal and lamb losses. Addressing mid-pregnancy abortion may improve the reproductive performance in some flocks.

A survey of farm management practices relating to the risk factors, prevalence, and causes of lamb mortality in Ireland

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Animals, Volume 12(1), January 2022 **OPEN ACCESS**

DOI https://doi.org/10.3390/ani12010030

Simple Summary

A reduction in lamb mortality would benefit farmers both economically and ethically. The major causes of lamb mortality are similar worldwide. Targeting the specific causes can result in reduced lamb mortality. This involves identifying underlying factors associated with lamb mortality and subsequently recommending changes to management practices. The objective of this study was to investigate the risk factors associated with lamb mortality on Irish sheep farms to provide a greater understanding of the necessary management practices required to reduce lamb mortality. This was achieved by identifying relationships between on-farm practices and risk factors of lamb mortality associated with these practices. Predators, lamb birth weight, and diseases were perceived by farmers to be the main causes of lamb mortality. Individual lambing pens were used on most sheep farms but were not cleaned and/or disinfected on 26% of them. Lamb mortality tended to be lower on farms that used best-known practices. Full-time farmers that used hospital and individual pens had a higher gross margin (€18/ewe). Management systems affect both lamb mortality and flock gross margin. Every 1% decrease in average lamb mortality across Irish flocks is worth ~€3 million annually to the Irish sheep sector.

Abstract

Lamb mortality is a key factor influencing ewe productivity and profitability. The current study investigated risk factors associated with and management practices implemented on sheep farms to reduce lamb mortality. A survey consisting of 13 multiple-part questions (57 separate questions) was administered to all sheep farmers participating in the Teagasc National Farm Survey, representative of the Irish national population of sheep farms. A total of 60% of respondents identify mating or lambing date, and this practice tended to be associated with reduced lamb mortality (1.2%, $p = 0.08$). Individual lambing pens were used by 88% of farmers, but 26% did not clean or disinfect them. A total of 79% and 9.5% of farmers applied iodine to all lambs' navels and administered antibiotics to all lambs to treat and/or prevent diseases, respectively. Most farmers vaccinated their ewes (86%) and lambs (79%) against clostridial diseases and/or pasteurellosis; 13% vaccinated against abortion agents. Lamb mortality tended to be lower (Kruskal–Wallis (KW) = 2.749; $p = 0.09$) on farms that used stomach tubing, heat box, iodine, hospital, and individual pens compared with farms that do not implement all those practices. Predators, lamb birth weight, and diseases were perceived by respondents to be the three main causes of live-born lamb mortality. The gross margin is significantly higher on lowland farms by €37 per ewe compared with hill farms (Kruskal–Wallis (KW) = 4.056; $p < 0.001$). The combination of full-time farming and the use of hospital and individual pens improved gross margin (€18/ewe, $p = 0.028$). It is concluded that on-farm management practices affect both lamb mortality and flock gross margin.

Validation of hand-held refractometers for assessing Merino ewe colostrum and neonatal lamb serum

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Animal Production Science, Volume 62(3), January 2022

DOI https://doi.org/10.1071/AN20630

Abstract

Context: The high incidence of lamb mortality in Merino sheep is a persistent issue for the industry. Poor-quality colostrum or inadequate colostrum consumption increases the risk of low energy intake and failed passive immunity transfer, resulting in lamb mortality. The rapid assessment of colostrum quality and intake would be a valuable tool for producers which house ewes for lambing.

Aims: This experiment determined the relationship and accuracy of analysis techniques to measure immunoglobulin G (IgG) and total protein (TP) concentrations within ewe colostrum and lamb serum and compared those results against digital hand-held refractometers.
Methods: Merino ewe colostrum and lamb blood were sampled at 4 and 24 h post-partum during autumn (n = 93 ewes) and spring (n = 79 ewes) in 2018. Colostrum was analysed for total milk solids (%) and lamb serum was analysed for total blood serum protein (%), and both colostrum and lamb serum were analysed for IgG and TP using in-house laboratory analysis techniques. Correlation coefficients were performed to identify the relationship between the different assessment methods.
Key results: There was a significant Pearson's correlation ($P < 0.05$) between 4 h total milk solids and TP ($R = 0.19$), between total milk solids and IgG ($R = 0.19$), and TP and IgG ($R = 0.38$). For 24 h colostrum samples, the significant correlations ($P < 0.001$) between TP and IgG ($R = 0.54$) and total milk solids and IgG ($R = 0.56$) were higher than the correlation between total milk solids and TP ($R = 0.24$; $P = 0.006$). Further, 4 h serum IgG ($R = –0.14$; $P = 0.026$) and 24 h total blood serum protein ($R = 0.21$; $P = 0.009$) were correlated with lamb survival to 72 h.
Conclusions: While the refractometer provided a crude measure of colostrum IgG and TP and was valuable in identifying lambs with low IgG transfer at 24 h, further research is required regarding analysis techniques to allow for reliable measures need to be refined.
Implications: The use of refractometers to assess colostrum quality and intake could benefit researchers or producers who practice indoor lambing.

Upcoming events

Date	Event	Location
17 -18 February 20022	Balmoral Breeders – Sheep Field Day Balmoral Breeders, AMSEA	Harrow, Vic
1 March 2022	MeatUp Forum MLA	Dubbo, NSW
8 March 2022	Livestock Technology Expo PIRSA, MLA, AWI/Sheep Connect SA, SA Sheep & Cattle Industry Funds	Keith, SA
10 March 2022	Livestock Technology Expo PIRSA, MLA, AWI/Sheep Connect SA, SA Sheep & Cattle Industry Funds	Kapunda, SA
25 March 2022	Leading Sheep MeatUp Forum AWI & MLA	Longreach, Qld