MAY 2025

Sheep reproduction RD&A alert

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

Three times a year, MLA and AWI run the joint Sheep Producer Intentions survey to collect wool and sheepmeat industry livestock numbers and lamb production expectations.

The May 2025 survey is open now.

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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 update

Improving the survival of triplet dams and their lambs

Background

The increased focus on the improving the reproductive performance of both Maternal and merino ewes through genetic improvement, ewe nutrition and management had increased the proportion of triplet-bearing ewes in the Australian sheep flock. The recently completed **Managing fecund flocks to improve survival of triplet dams and their lambs** project found that this this has increased the risk of ewe and lamb mortality as less than 5% of ewes are scanned for triplet foetuses, yet on average, 5.9% of all ewes joined were identified as carrying triplets.

Aim

To identify knowledge gaps on management practices to reduce the mortality of triplet-bearing ewes and their lambs and investigated a suite of management practices to quantify their impact on the survival of triplet-bearing ewes and their lambs.

Project Outcomes

Pregnancy scanning to identify triplet-bearing ewes is critical to improving the survival of these ewes and their lambs. The **Managing fecund flocks to improve survival of triplet dams and their lambs** project developed targets for ewe condition score during pregnancy and mob size during lambing to increase the survival of triplet ewes and their lambs and overall profitability. The potential increase in profitability from scanning for triplets and applying optimum management were up to $23 per triplet maternal ewe.

Producer resources

A set of resources including fact sheets and best practice guides for Maternal and Merino ewe flocks are now available to assist sheep producers and their advisors to get the most out of scanning triplet-bearing ewes and manage them to improve productivity. The resources are now available from the SRSP website:

- Identification of triplet bearing ewes – what's happening, who, when and why?
- Maternal ewes
  - Triplet best practice guide
  - Triplet ewe survival factsheet
  - Triplet lamb survival factsheet
- Merino ewes
  - Triplet best practice guide
  - Triplet ewe survival factsheet
  - Triplet lamb survival factsheet

For more information on the **Managing fecund flocks to improve survival of triplet dams and their lambs** project you can access the Final report for the project or contact Andrew Thompson (andrew.thompson@murdoch.edu.au).

Review papers

Periparturient mortality in Merino ewes in Australia: Incidence, impact and the path to mitigation strategies

B Kirk (b.kirk@student.unimelb.edu.au), T Clune, E de Looff, J Jones, S Barber, D McGill, L Rowlands, S McGrath, J Kelly, A Whale, C Jacobson and E Glanville

Australian Veterinary Journal, Volume 103, Issue 5, May 2025 **OPEN ACCESS**

DOI https://doi.org/10.1111/avj.13430

Abstract

Managing breeding ewe mortality is a priority for the Australian sheep industry. The periparturient period carries the highest risk of mortality, but the incidence and causes in Merino ewes are not well characterised. Here, we outline the reported incidence of annual and periparturient mortality for Australian Merino ewes, causes and risk factors for ewe mortality and current recommendations for managing periparturient ewes and gaps in the literature. The mean incidence of periparturient mortality reported in Merino ewes ranges from 0.3% to 11.4%. However, there are challenges with reporting mortality figures in extensive production systems due to the nature of record keeping and farm characteristics. Studies reporting causes of periparturient mortality indicate that these are typically multifactorial, with metabolic disease and dystocia likely to be important. Identifying potential mitigation strategies has the potential to improve productivity, profitability and welfare on Australian farms.

MLA Project L.LSM.0036 Merino ewe mortality – prevalence, causes and mitigation strategies

Double artificial insemination in sheep: a comprehensive review

Gabriel Maggi, Fabiane Pereira de Moraes, Fernando Caetano de Oliveira, Sergio Farias Vargas Júnior, Arnaldo Diniz Vieira, Rafael Gianella Mondadori and Bernardo Garziera Gasperin

Animal Reproduction Science, Volume 22, Issue 2, May 2025

DOI https://doi.org/10.1590/1984-3143-AR2024-0055

Abstract

Artificial insemination (AI) in sheep presents variable results, especially when combined with estrus induction treatments during the anestrous period. Alternatives for obtaining better results without significantly altering the costs of hormonal protocols are essential because of the importance of this biotechnology in production systems. One alternative that potentially meets these requirements is double-AI. Therefore, this article aims to review the literature on double-cervical AI in sheep and identify gaps in existing knowledge. Double

cervical superficial (CS) AI with frozen-thawed (F.T.) semen after estrus detection significantly increased pregnancy rates (PR) in most (6/8) evaluated studies, with an increase of 7 to 34.2 percentual points (p.p.), compared to single AI. Regarding fixed-time AI (FTAI), all studies used fresh (F) or chilled (C) semen, and no positive effects were observed for double FTAI in most cases (8/9). Most studies have not applied current estrous synchronization protocols and insemination doses. Therefore, further studies are needed to evaluate the potential benefits of double FTAI, especially using F.T. semen in combination with hormonal protocols and insemination doses aligned with current practices.

Scientific papers

The social dominance of the rams did not influence their sexual behavior but did affect the number of lambs sired and the lambing rates

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Animal Science Journal, Volume 96, Issue 1, January/December 2025

DOI https://doi.org/10.1111/asj.70060

Abstract

The objective of this study was to evaluate the sexual behavior of rams based on their social dominance (SD) when paired into dyads consisting of dominant rams (DRams) and subordinate rams (SRams) across two breeding seasons (BS) and to assess its impact on the number of lambs sired and lambing rate. Twelve adult rams (six dyads per BS) were used and introduced to 17 and 18 ewes during the summer breeding (SumB) and winter breeding (WinB) seasons, respectively. There were no differences in SD, except for the flehmen response ($p < 0.0001$). Significant differences ($p < 0.05$) were found in body development and scrotal circumference, as well as in the sexual inspection traits between BS and ram group. The breeding week influenced each sexual behavior variable ($p < 0.05$). A higher percentage of single lambing was observed in WinB (46.2%) compared to SumB (27.4%) ($p < 0.05$). SD had an effect on the type of lambing ($p < 0.05$), with DRams exhibiting 35.6% twin lambing, while SRams showed only 10.6%. In conclusion, SD did not impact the sexual behavior of hair rams. SD influenced the lambing rate, with DRams producing a higher percentage of twin lambs compared to SRams in hair ewes during the breeding season.

The cervical microbiome of ewe breeds with known divergent fertility following artificial insemination with frozen-thawed semen

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Scientific Reports, 15, April 2025 **OPEN ACCESS**

DOI https://doi.org/10.1038/s41598-025-97735-4

Abstract

The use of artificial insemination (AI) with frozen-thawed semen in sheep is limited internationally due to low pregnancy rates. An exception is Norway, where high success rates routinely occur following vaginal deposition of frozen-thawed semen during natural estrus. Previous research suggests that breed-specific differences in pregnancy rates may result from impaired cervical sperm transport. This study compared cervical microbiomes among sheep breeds with known differences in pregnancy rates after AI. Cervical samples were collected from Suffolk (low fertility) and Belclare (medium fertility) breeds in Ireland, and

Norwegian white sheep (NWS) and Fur breeds (both high fertility) in Norway, during the follicular phase of both natural and synchronized estruses, and the luteal phase of synchronized estrus. Amplicon sequencing revealed significantly higher bacterial abundance during the follicular phase in the low-fertility Suffolk breed compared to high-fertility breeds. Alpha diversity was higher in Suffolk and Belclare breeds, especially during the natural follicular phase, coinciding with pronounced beta diversity differences among breeds. Genus Histophilus was the top feature leading to microbial differences between ewe breeds and types of cycle. Ewe breed was the main driver of cervical microbial composition; increased microbial load in lower-fertility breeds may negatively impact sperm survival/transport, hampering AI success.

Subclinical pregnancy toxemia affects blood parameters of ewes and impairs postnatal growth and development of lambs

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Veterinary Medicine and Science, Volume 11, Issue 3, May 2025 **OPEN ACCESS**

DOI https://doi.org/10.1002/vms3.70259

Abstract

Pregnancy toxemia (PT) is a common metabolic disorder that occurs in the last trimester of pregnancy. This study aimed to detect the effects of subclinical PT (SPT) on serum biochemical parameters of ewes and postnatal growth and development of lambs in Romanov sheep. A total of 40 ewes and 69 lambs were included in the study. Blood samples of ewes were collected at the time of parturition to evaluate serum beta-hydroxybutyric acid (βHBA), serum nonesterified fatty acid (NEFA), cholesterol, and triglyceride. Live weight and body measurements of lambs were recorded at birth (0th day), 30th day, and 60th (weaning) day. In the diagnosis of SPT serum βHBA concentrations were taken into account. A cut-off value of 0.8 mmol/L for βHBA was a critical concentration and ewes with 0.8–1.6 mmol/L βHBA were evaluated as SPT. There were no ewes with BHBA value higher than 1.6 mmol/L (clinical PT) in the study. There was no significant difference in serum βHBA, NEFA and cholesterol concentrations between ewes regarding birth type (single, twin, and triplet). However, triglyceride concentrations were higher ($p < 0.001$) in ewes giving birth to triplets compared to ewes giving birth to single lamb. Serum βHBA and triglyceride concentrations were higher ($p < 0.01$) in ewes with SPT ($n = 14$) compared to healthy ewes ($n = 26$). There was no significant difference between ewes with SPT and healthy ewes in serum NEFA and cholesterol. Repeated measures ANOVA results indicated that SPT negatively affected 0th, 30th, and 60th body weights of twin ($p < 0.01$) and triplet born lambs ($p < 0.05$). The effect of time on body weights was also found to be significant ($p < 0.001$). Similarly, most of the body measurements of twin and triplet born lambs were lower ($p < 0.05$) in the SPT group compared to healthy group. Overall results indicate that SPT may negatively affect postnatal growth and development in Romanov lambs. Because a decline in growth performance has many negative outcomes affecting production traits in sheep, these findings may be valuable for the veterinary field.

Whole-genome transcriptome and DNA methylome analyses reveal molecular abnormalities during the oocyte-to-embryo transition in preimplantation embryos derived from prepubertal lamb oocytes

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Biology of Reproduction, Volume 112, Issue 5, May 2025

DOI https://doi.org/10.1093/biolre/ioaf045

Abstract

The juvenile in vitro embryo transfer technology holds the potential to accelerate livestock breeding. However, its application is limited due to the weak in vitro development of oocytes and embryos from prepubertal lambs. To dissect the regulatory networks of gene expression of sheep embryos and identify the defects in gene expression in prepubertal lamb embryos during the oocyte-to-embryo transition, full-length RNA sequencing and whole-genome bisulfite sequencing based on trace cells were conducted on in vitro-derived embryos generated from adult sheep and prepubertal lamb oocytes. We found that the maternal transcript degradation occurred selectively in adult sheep embryos in multiple waves and was most completed until the morula stage. Major embryonic genome activation was found to occur at the morula stage. By comparing with the patterns of adult embryos, we observed incomplete maternal transcript degradation and abnormal embryonic genome activation in lamb embryos and analyzed their potential molecular mechanisms. Furthermore, we explored dynamic DNA methylation concerning the paternal and maternal genomes during the preimplantation development of sheep embryos, revealing the negative regulatory role of promoter DNA methylation on embryonic genome activation process. Lamb embryos generally displayed higher DNA methylation levels than adults, potentially repressing the embryonic genome activation gene expression, especially the genes associated with ribosomal and mitochondrial organization. We also found abnormalities in the methylation status of imprinted genes in lamb embryos. Our findings advance the understanding of sheep in vitro embryo development and offer insights for improving the juvenile in vitro embryo transfer technology in livestock.

Early life reproductive investment affects longevity in ewes

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Animal, Volume 19, Issue 5 May 2025 **OPEN ACCESS**

DOI https://doi.org/10.1016/j.animal.2025.101504

Highlights

- Impact of early life reproduction on longevity was investigated.
- Lifespan is negatively impacted by early reproduction.
- Increased reproductive investment beyond a litter size of 2 reduces lifespan.
- No consistent effect on latitude for lifespan was observed.
- Environmental effects on reproduction and longevity need further investigation.

Abstract

To increase lifetime production of ewes, it has been suggested to mate ewe lambs. However, research on the effect of age at first lambing on longevity has shown conflicting results. This study investigated the impact of early life reproduction (i.e., the effect of age at first lambing and litter size) and environmental conditions on longevity in a prolific sheep breed traditionally bred as lambs. Lifetime performance data were obtained from 550 884 Norwegian White Sheep born between 2000 and 2013 spread across Norway. All ewes lambed their first litter either as 1-year-old or 2-year-olds. Longevity was investigated using a linear mixed model with age at first lambing, litter size, county, the covariates early- and late parturition, and two categorical variables describing cross-fostering and success in weaning as fixed effects. Herd x year was fitted as a random effect. The lifespan of the ewes was affected both by age of the ewe at first reproduction and the reproductive investment (i.e., litter size). The predicted lifespan for ewes mated as lambs was 1 548 days (4.2 years) whereas the lifespan for those mated as 2-year-olds was 1 700 days (4.7 years). There was a curvilinear relationship between lifespan and litter size. Lifespan increased from 1 272 days (3.5 years) to 1 618 days (4.4 years) when litter size increased from 0 to 1 lamb. Further increased reproductive investment resulted in a decreased lifespan with a litter size of 4 having the shortest lifespan of 1 468 days (4.0 years). The relation

between litter size and lifespan was similar but at different levels for both age groups of ewes, except for ewes rearing less lambs than they gave birth to. In that group, ewes mated as lambs had a peak predicted lifespan at 1 504 days (4.1 years) with a litter size of one lamb, whereas those first mated as 2-year-olds had their peak predicted lifespan of 1 650 days (4.5 years) with a litter size of two lambs. The relationship between longevity and reproductive investment was in some cases affected by environmental conditions. However, the effect was not consistent with latitude. In conclusion, ewes mated as lambs, in general, live shorter lives compared to those first mated as 2-year-olds but environmental importance for longevity and reproduction needs further investigation.

Heat stress affects the functionality of the ovine cumulus-oocyte complex and subsequent in vitro embryo production

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Scientific Reports 15, 17163 **OPEN ACCESS**

DOI https://doi.org/10.1038/s41598-025-01173-1

Abstract

Global population growth requires an increase in the production of food, particularly meat, with an expected increase in sheep farming. However, climate change challenges livestock management, with heat stress negatively impacting reproductive performance. In vitro embryo production (IVP) in sheep farming is promising, although optimizing embryo quality and efficiency remains challenging. Heat stress impairs oocyte developmental competence, affecting IVP outcomes. This study investigated the effects of season on oocyte quality and embryo production given seasonal variations in the temperature and temperature–humidity index (THI) and in vitro-induced heat stress. In the first experiment, ovaries were collected in four seasons (winter, spring, summer and autumn), with differences in THI, and in the second experiment, ovaries were exposed to 30 °C (control), 38.5 °C, 40 °C and 41 °C. The results indicated that elevated summer temperatures significantly compromised oocyte and cumulus cell viability, DNA integrity, mitochondrial distribution, and blastocyst quality. These detrimental effects persisted into autumn, likely due to a carry-over effect from summer heat stress. Furthermore, in vitro exposure to temperatures at or above 38.5 °C led to marked decreases in oocyte quality and blastocyst rates. Understanding these effects is essential for developing strategies to mitigate heat stress and enhance reproductive outcomes in sheep.

Transmembrane protein 95 as a promising molecular marker of ram sperm functionality

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Theriogenology, Volume 242, August 2025 **OPEN ACCESS**

DOI https://doi.org/10.1016/j.theriogenology.2025.117440

Highlights

- Sperm capacitation in vitro increases TMEM95 protein profile.
- Sperm preservation processes cause sperm membrane damage, affecting TMEM95 profile.
- TMEM95 profile decreases after 48 h of liquid storage at 5 °C.
- TMEM95 protein profile is negatively affected by the cryopreservation process.

Abstract

The optimization of preservation protocols (refrigeration and freezing) in ovine species is necessary for a wider diffusion of artificial insemination in this species. Besides the ram sperm quality assays, the

characterization of novel proteins could be crucial for improving these protocols employing biomarkers. The protein transmembrane 95 (TMEM95) is a sperm membrane protein associated with oocyte-sperm fusion previously described in bull or mouse. However, this protein has not yet been characterized in the ram until now. In this work, different experimental groups based on sperm functionality: capacitated, refrigerated at different times (5 °C 24 h, 5 °C 48 h, and 5 °C 72 h), and frozen-thawed sperm samples were analyzed and compared to initial sperm quality samples (15 °C 3 h) to characterize the expression of this novel protein and its relationship with other sperm quality markers (motility, kinetic parameters, viability, apoptosis-like events, mitochondrial function, acrosome-reacted, zinc content as marker of capacitation). In addition, capacitation status was tested by Fluozin-3, a novel fluorescent probe measuring zinc content used for the first time in ram sperm. After capacitation induction, as expected, acrosome reactive spermatozoa and zinc signature 2 and 3 were significantly increased, while linearity was significantly ($P < 0.05$) decreased compared to non-capacitated samples. Concerning TMEM95, its profile was significantly ($P < 0.05$) increased after the capacitation process, confirming its relationship with this spermatozoa status. Attending to preservation processes, as expected, semen quality decreased progressively during liquid storage, and a significant ($P < 0.05$) decrease was observed at 24 h according to fast progressive motility and linearity. TMEM95 profile showed the same decrease tendency, showing a significant reduction ($P < 0.05$) at 48 h with respect to the control samples. Finally, after the cryopreservation process, the semen quality of the thawed samples suffered a detrimental effect compared to the initial control sample, concerting all studied parameters accomplished by a significant ($P < 0.05$) decrease in TMEM95 profile compared to initial control samples. When we analyzed the TMEM95 correlation with other sperm quality markers, the highest positive correlations observed were with low sperm quality parameters in capacitated samples, such as apoptosis-like changes and acrosome-reaction. On the other hand, the highest positive correlations observed between TMEM95 and sperm quality parameters in preservation process samples were observed with suitable sperm quality parameters (motility, viability, and mitochondrial functionality).

According to our results, this novel protein could be considered a predictor of early damage in ram sperm preservation protocols (cooling and freezing), considering its relationship with capacitation and membrane integrity status.

Lamb survival and ewe longevity in a crossbreeding program between indigenous and exotic sheep in semi-arid lands

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Small Ruminant Research Volume 249, August 2025 **OPEN ACCESS**

DOI https://doi.org/10.1016/j.smallrumres.2025.107520

Highlights

- The first generation lambs have better post-weaning survival than other crossbreds.
- The first generation ewes have better longevity than other crossbreds.
- The pure Red Maasai breed has a higher pre-weaning heritability estimate.
- Pre-weaning lamb survival should be included in selection indices.
- Better management of lambs pre-weaning can improve their survival.

Abstract

The survival of lambs and longevity of ewes within flocks are important for the sustainability of sheep populations especially in arid and semi-arid lands (ASAL). In this study we conducted pre- and post-weaning survival analysis of lambs and the longevity of ewes of indigenous pure Red Maasai (RRRR), pure Dorper (DDDD), and their crosses comprising F1 (DDRR) and 75 %Dorper-25 %Red Maasai (DDDR) using Cox and Weibull proportional hazard models. The objective was to determine the genetic and non-genetic factors

affecting lamb survival to yearling as well as ewe longevity. Data comprised records on 6313 lambs and 2003 ewes. Overall pre-weaning mortality was lower (5 %) compared to post-weaning mortality rate (17 %). Lambs born during the long dry season had a higher risk of dying than those born during the wet seasons. For both lambs and ewes, the Dorper had the highest risk of dying or being culled. Among the crossbreds, the DDDR lambs and ewes had higher risks of dying or being culled relative to F1 lambs and ewes. The risk of ewes being culled reduced with increasing age at first lambing and parity. Heritability estimates for pre-weaning mortality were higher (0.10–0.14) than post-weaning mortality (0.01–0.05). The higher heritability for pre-weaning lamb survival in indicates greater genetic variation, presenting an opportunity for selection for lamb survival. Interventions to improve the production environment in the ASAL areas would also improve the survival of lambs and longevity of ewes.

Correlation between PRDX6 levels and freezability properties of sheep semen

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Theriogenology, Volume 243, September 2025

DOI https://doi.org/10.1016/j.theriogenology.2025.117461

Highlights

- PRDX6 is associated with the freezability of sheep sperm.
- PRDX6 enhances the freezability of sperm through two enzymatic activities.
- 20 μg/ml PRDX6 recombinant protein improves sperm quality and reduces freezability differences in both HF and LF sperm.

Abstract

Individual variations in the freezability properties of sheep semen may be related to the antioxidant levels of sperm. PRDX6 is a key antioxidant protein in sperm, but its relationship with the freezability properties of sheep semen remains unclear.

This study, using Hu sheep as the research subject, investigated the levels of PRDX6 in sperm with different freezability properties. A positive correlation was found between the levels of PRDX6 and sperm freezability. Furthermore, when different concentrations of PRDX6 recombinant protein were added to high-freezing-resistant (HF) and low-freezing-resistant (LF) sperm, it was revealed that 20 μg/ml of PRDX6 recombinant protein significantly improved various sperm quality parameters in both HF and LF sperm and reduced the differences in sperm freezability properties. Finally, adding a PRDX6 peroxidase activity inhibitor (Ethacrynic acid) or a calcium - independent phospholipase A2 (iPLA2) activity inhibitor (MJ33) to the diluent significantly reduced the freezability parameters of sperm. This indicates that PRDX6 protects sperm from freezing damage through two pathways. In summary, this study reveals the crucial role of PRDX6 in the freezability properties of sheep semen. It suggests that increasing the levels of PRDX6 in sperm may be an effective strategy to improve the quality of cryopreserved semen. Future research can further explore the molecular mechanisms regulating the levels of PRDX6, providing a scientific basis for the optimization of sheep semen cryopreservation techniques.

Improvement of cryopreserved epididymal ram sperm quality and fertility through curcumin nanoparticles

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Theriogenology, Volume 243, September 2025

DOI https://doi.org/10.1016/j.theriogenology.2025.117462

Highlights

- Curcumin nanoparticles significantly enhanced the quality of cryopreserved ram sperm.
- Nanoliposome formulation improved curcumin solubility and bioavailability.
- 25 µM curcumin NPs increased sperm motility, viability, and structural integrity.
- Improved fertility outcomes observed in the 25 µM curcumin NPs group.

Abstract

Artificial insemination (AI) in rams relies on effective sperm preservation; however, freezing and thawing processes induce oxidative stress and sperm damage. This study evaluated the antioxidant effects of curcumin, in both free and nanoparticles (NPs) forms, on cryopreserved ram sperm. Curcumin was incorporated into the sperm extender at concentrations of 0, 25, and 50 µM. The curcumin NPs formulation, prepared using the nanoliposome technique, improved curcumin solubility and bioavailability. The 25 µM curcumin NPs group showed significantly higher sperm motility (total motility: 72.67 ± 1.15 %, progressive motility: 59.2 ± 0.96 %) compared to the control (total motility: 59.75 ± 0.68 %, progressive motility: 46.23 ± 1.50 %) ($p < 0.05$). Membrane (75.77 ± 0.87 %) and acrosome integrity (80.67 ± 0.87 %) were significantly improved in the 25 µM NPs group compared to those in the control (61.76 ± 0.97 %, 66.77 ± 1.50 %) ($p < 0.05$). Sperm viability was higher in the 25 µM NPs group (76.76 ± 1.22 %) vs. control (64.93 ± 0.80 %) ($p < 0.05$), and early apoptosis was reduced (5.06 ± 0.36 % vs. 9.7 ± 0.7 %) ($p < 0.05$). Oxidative stress markers were also improved, with lower MDA and ROS levels and enhanced antioxidant enzyme activity. The 25 µM curcumin NPs did not alter CYTb copy number. The 25 µM curcumin NPs group had higher fertility outcomes, including pregnancy (58.33 %), birth (58.33 %), and lambing (83.33 %) rates, than the control and 50 µM curcumin groups. These findings indicate that curcumin nanoparticles enhance sperm quality and fertility in cryopreserved ram sperm.

Biostimulation with rams improved embryo quality without modifying the ovulatory response in superovulated ewes

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Theriogenology, Volume 243, September 2025

DOI https://doi.org/10.1016/j.theriogenology.2025.117463

Highlights

- Rams stimulated ewes during 72 h during a superovulatory treatment.
- Ram stimulation did not modify follicular growth or ovulation rate.
- Embryo quality was enhanced in stimulated ewes.
- Those embryos had greater expression of transcripts associated with energy metabolism and cell adhesion.
- The ram effect reduced the expression of genes linked to oxidative stress and apoptosis in embryos.

Abstracts

The aim of this study was to evaluate whether extended ram exposure during FSH superovulatory treatment improves follicular growth, embryo production, and embryo quality in ewes. Twenty Santa Inês ewes were subjected to a superovulation protocol based on follicle-stimulating hormone (FSH) administration with or without male biostimulation in a crossover arrangement (n = 20 per treatment). Follicular development and corpus luteum functionality were monitored with ultrasound, and embryo collection was performed non-

surgically. Recovered embryos were analyzed for gene expression, reactive oxygen species (ROS) levels, and blastomere count. Male biostimulation for 72 h did not modify the number or diameter of antral follicles, the recovery rate of structures, reactive oxygen species (ROS) levels, and blastomere count. However, it reduced the expression of genes linked to oxidative stress (PRDX1) and apoptosis (BCL2) in embryos. In summary, exposure to rams for 72 h during superovulatory treatment influenced molecular indicators of development competence, specifically the relative abundance of BCL2 and PRDX1 transcripts, which are associated with cellular apoptosis and stress. However, it did not improve the ovarian responses.

Upcoming events

Date	Event	Location
12 June 2025	Ewe management and feed planning Agriculture Victoria	Wonwondah, Vic
17 June 2025	Success with grazing winter crops AWI Extension NSW	Webinar
18 June 2025	Looking after your livestock, looking after you Agriculture Victoria	Chetwynd, Vic
24 June 2025	Managing sheep nutrition in dry times AWI Extension NSW	Webinar
1 July 2025	BredWell FedWell Meat & Livestock Australia	Dubbo, NSW