

APRIL 2026

Sheep reproduction RD&A alert

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

[BulkUp](#) is MLA's new adoption program, a long-term, peer-supported learning program designed to help red meat producers improve production efficiency, lift profitability and build more resilient farm businesses. BulkUp brings together adoption packages into a single, structured pathway – supporting producers to lift performance through targeted technical learning, informed decision-making and benchmarking.

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MLA is currently seeking expressions of interest from red meat producers, group coaches and business analysts to participate in the first phase of the program.

For more information on the BulkUp program, please contact Mitchell Plumbe MLA Project Manager – Adoption Southern & Western Production Systems (mplumbe@mla.com.au) or Stuart Bull MLA Project Manager – Southern Livestock Adoption (sbull@mla.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.

Scientific papers

Effects of feeding *B. subtilis* and *B. licheniformis* on the growth and carcass characteristics of feedlot lambs

J.D. Morris, G.T. Fosgate, L. Odendaal, E.C. Webb and S.J. Clift

South African Journal of Animal Science, Volume 56, Issue 4, April 2026

DOI <https://doi.org/10.17159/sajas.v56i04.01>

Abstract

This study investigated the effects of dietary *Bacillus subtilis* and *Bacillus licheniformis* supplements on the growth performance, carcass characteristics, dressing percentage, morbidity, and mortality of weaner lambs under commercial South African feedlot conditions. The blinded field trial included 649 Merino lambs, with an average age of four months and an average weight of 30 kg at the start of the trial. These lambs were randomly allocated to either a probiotic-supplemented diet or a control diet. Lambs were weighed, ear-tagged, and stratified by initial body weight before allocation to treatment groups. Lambs were initially

allocated at 65 lambs per pen across 10 pens (five pens per treatment group, 325 lambs per treatment); however, one lamb died during transport prior to pen allocation, leaving a total of 649 lambs enrolled in the study. Probiotic supplementation did not significantly affect overall average daily gain, but differences were observed in interval growth rates between days 15 and 28. Lambs receiving probiotics had numerically higher feed intakes, but a descriptively higher feed conversion ratio compared to the controls. The probiotic treatment group also had a lower dressing percentage and higher incidences of low-grade rumen parakeratosis. No significant differences were observed between the groups for overall morbidity and mortality during the feeding period. These findings suggest that probiotic supplementation can improve growth during the first 28 days of the feeding period; however, the negative effects on rumen and lung health (bronchopneumonia and rumen parakeratosis) that developed in the probiotic-supplemented lambs during the feeding period should be noted.

Rumen microbiome development in lambs following maternal and early-life prebiotic mannan-rich fraction (MRF) supplementation

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Animals, Volume 16, Issue 8, April 2026 **OPEN ACCESS**

DOI <https://doi.org/10.3390/ani16081137>

Simple Summary

Early life is a critical period for lamb development, as rumen microorganisms help shape digestion, growth and overall health. This study looked at whether adding a natural yeast-based supplement to the diet of lambs, their mothers, or both could improve rumen microbial development and growth performance. The results showed that lambs receiving the supplement, especially when their mothers were also fed it, developed a more diverse and balanced microbial community in the rumen. The microbiome compositional shifts associated with supplementation also suggested a shift in fermentation pathways. While growth performance metrics did not differ significantly between dietary groups, lambs receiving both maternal and direct supplementation showed the highest median values for growth performance, suggesting potential biological relevance. Overall, these findings suggest that feeding this supplement during pregnancy and early life may influence rumen microbial development and fermentation patterns, with potential implications for digestive function and efficiency in sheep production systems.

Abstract

The early-life rumen microbiome is highly dynamic, shaped by dietary transitions and maternal influences. Several dietary additives have been studied during the pre- and post-weaning periods to improve animal welfare, growth performance, and farming efficiencies. This study investigated microbial community assembly and growth performance of lambs provided with a mannan-rich fraction (MRF) supplement, either through maternal supplementation, directly, or via a combination of both. Using metagenomic sequencing and gas chromatography, we found differences in rumen microbial alpha and beta diversity related to both sampling time point and MRF supplementation ($p < 0.05$). At week 8, lamb microbiomes showed greater variance in their Shannon alpha diversity, with direct MRF supplementation only to the lamb resulting in a significantly greater diversity ($p < 0.05$). At week 20, combined maternal and lamb supplementation resulted in the highest Shannon diversity and was different compared to all other groups ($p < 0.05$). Beta diversity analyses combined with differential abundance analyses revealed that microbial community structures are driven by both diet and time, with maternal MRF supplementation associated with enrichment of taxa involved in carbohydrate fermentation and succinate metabolism, including *Succinivibrio ruminis*, *Succinovibrio dextrinosolvens*, and *Fibrobacter succinogenes*. Generalized linear modeling identified

significant associations between microbial alpha diversity metrics and total volatile fatty acids in lambs, particularly butyrate and valerate. Furthermore, at week 8, there was a significant positive correlation between alpha diversity metrics and propionate and valerate. In this study, lambs receiving MRF through maternal and direct supplementation had the highest growth performance, measured as the median average daily gains (kg) and final weights (kg) of lambs. These findings suggest that MRF supplementation, especially when provided both maternally and directly, may influence the lamb rumen microbiome and alter its metabolic potential with potential implications for optimizing early-life nutrition strategies in ruminant production systems.

Malic acid supplementation on rumen fermentation, nutrient digestibility, performance and carcass traits in lambs: A meta-analysis and meta-regression considering dietary moderators

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Animals, Volume 16, Issue 8, April 2026 **OPEN ACCESS**

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Simple Summary

The restriction of antimicrobial feed additives has increased interest in nutritional strategies that can support rumen function and animal performance. Malic acid is a naturally occurring organic acid that has been proposed as a dietary supplement for ruminants because of its potential to influence ruminal fermentation. However, results from studies conducted with lambs are inconsistent, limiting clear conclusions about its effectiveness. This study combined data from multiple experiments to evaluate the effects of malic acid supplementation on ruminal fermentation, growth performance, carcass traits, and nutrient digestibility in lambs, while accounting for differences in diet composition. The results showed that malic acid supplementation increased the concentration of fermentation products that supply energy to the animal, particularly in diets with higher forage inclusion. Small improvements in growth performance were observed, whereas carcass characteristics and overall nutrient digestibility were not consistently affected. The findings indicate that the response to malic acid supplementation depends strongly on dietary conditions rather than on the additive alone. These results help explain the variability reported in individual studies and highlight the importance of considering diet composition when evaluating organic acid supplementation strategies in lamb production.

Abstract

This meta-analysis and meta-regression evaluated how malic acid supplementation modulates rumen fermentation and its consequences for growth performance, nutrient digestibility, and carcass traits in lambs. Effect sizes (ES) were estimated using a random-effects model. Dietary composition was explored by meta-regression as a key source of heterogeneity, and subgroup analyses were used to compare free malic acid (FMA) and malate. Ruminal pH was not affected by malic acid supplementation. In contrast, total volatile fatty acid concentration increased with malic acid supplementation, particularly in studies using FMA. No effects were detected for propionate concentration, whereas acetate concentration increased (ES = 0.502; $p = 0.036$). A tendency toward a reduced ruminal acetate proportion was observed (ES = -0.683; $p = 0.072$). Malic acid supplementation tended ($p = 0.057$) to increase body weight gain (BWG; ES = 0.325) and final body weight (FBW; ES = 0.234). Malic acid supplementation did not affect carcass traits or overall nutrient digestibility. Meta-regression consistently identified fiber intake-related variables as major moderators of the effects of malic acid. Overall, the effects of malic acid supplementation on lamb performance appear to be primarily driven by its modulation of rumen fermentation and strongly conditioned by dietary context.

Genetic parameter estimation for plasma biomarkers associated with energy reserves during critical physiological stages in sheep

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Journal of Animal Breeding and Genetics, Volume 143, Issue 3, May 2026 **OPEN ACCESS**

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Abstract

The ability of ruminants to mobilise and restore body reserves (BR) over time, referred to as BR dynamics, is currently considered an interesting biological component to be included in breeding programs targeting enhanced BR resilience. However, genetic studies of proxies for BR levels and BRD remain scarce, particularly in small ruminants. The aim of this study was to estimate the genetic parameters for key plasma biomarker concentrations in sheep at critical physiological stages (PhySt i.e., mating; mid-pregnancy, before-lambing, after-lambing, and weaning), and their changes over time. Non-esterified fatty acids (NEFA), β -hydroxybutyrate (BHB), triiodothyronine (T3) and insulin (INS) were monitored at those PhySt in successive production cycles. A total of 659 productive Romane ewes were phenotyped for one ($n = 252$, multiparous) or two ($n = 407$, primiparous and multiparous) cycles. BR mobilisation was observed from the second half of pregnancy and during suckling while BR accretion was more evident from weaning until the next mid-pregnancy. Considering biomarkers concentrations as repeated measurements through the whole production cycle, heritability estimates were 0.07, 0.09, 0.15, and 0.10 for NEFA, BHB, T3, and INS, respectively. Heritability estimates for plasma biomarkers at key PhySt ranged from 0.08 to 0.16 for NEFA, 0.07 to 0.12 for BHB, 0.09 to 0.18 for T3, and 0.04 to 0.15 for INS. Heritability estimates for biomarker changes over time ranged from 0.01 to 0.23. Genetic correlation estimates between different PhySt were positive for each plasma biomarker and ranged from 0.19 to 0.87 for NEFA, from 0.50 to 0.89 for BHB, from 0.54 to 0.95 for T3 and from 0.34 to 0.90 for INS. Most genetic correlation estimates between biomarkers at a given PhySt were generally low to moderate ($r_g = -0.52$ to 0.59), with few showing strong negative or positive values beyond 0.60 in magnitude. Considering changes over time, correlations were similarly low to moderate ($r_g = -0.59$ to 0.53), with only a few estimates reaching high values ($r_g = -0.60$ to -0.97 and 0.67 to 0.97). This study demonstrates that blood biomarkers related to energy BR have genetic variation, indicating their potential for implementation in sheep breeding programs aimed at improving BR use and build-up.

Supplementation of Baicalin (BC) in extender improves structural and functional characteristics, total antioxidant capacity, and in vivo fertility of ram semen

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Animal Reproduction Science, Volume 288, May 2026

DOI <https://doi.org/10.1016/j.anireprosci.2026.108139>

Highlights

- Baicalin serves as a potent antioxidant in ram semen freezing extenders.
- Baicalin supplementation improves ram sperm quality in cooling and post thawing.
- Baicalin lowers malondialdehyde (MDA) concentration in frozen-thawed sperm.
- Post-thaw fertility rates were markedly higher in Baicalin-treated groups.

Abstract

This investigation was aimed to evaluate the effects of Baicalin (BC) supplementation on ram semen quality during cooling, post-thaw sperm characteristics, oxidative status, and fertility outcomes. Semen samples were collected twice weekly from four reproductively sound rams using an artificial vagina, yielding a total of 64 ejaculates. The ejaculates were pooled and diluted at a ratio of 1:4 with a Tris-citric acid-fructose-yolk extender (TCFY), enhanced with varying concentrations of BC (0.50, 0.75, or 1 μ M). Diluted, samples were loaded into 0.25 mL straws, gradually cooled to 5°C over 90 min, cryopreserved in liquid nitrogen vapor, and thawed after 24 h in a 37 °C water bath for 30 s. Results showed that BC supplementation at 0.50 and 0.75 μ M significantly improved sperm quality parameters after cooling and freezing–thawing ($P < 0.01$), whereas 1 μ M BC did not differ from the control. The highest values for progressive motility (43.36 ± 1.54 %), viability (56.14 ± 1.44 %), and membrane integrity (52.34 ± 1.22 %) were observed at 0.75 μ M BC. Fertility rates following artificial insemination increased from 20.68 % in the control group to 51.66 % and 52.38 % in the 0.50 and 0.75 μ M BC groups, respectively. In conclusion, supplementation of semen extenders with 0.75 μ M Baicalin effectively enhances post-thaw sperm quality and fertility in rams.

Ruminally unprotected guanidinoacetic acid supply in sheep diets is effective in improving oocyte quality through mitochondrial function and by modulating regulatory gene markers that encode follicular growth, estrogen synthesis, and antiapoptotic activity

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Animal Reproduction Science, Volume 288, May 2026 **OPEN ACCESS**

DOI <https://doi.org/10.1016/j.anireprosci.2026.108142>

Highlights

- Glycocyamine creatine-inductor as a novel supplement to boost sheep ovarian function.
- Dietary intake increases by guanidinoacetic acid.
- Guanidinoacetic acid optimizes ovarian follicular growth.
- Supplementation with guanidinoacetic acid improves oocyte metabolic function.
- AMH and CCND2 genes are upregulated by guanidinoacetic acid.)

Abstract

Guanidinoacetic acid (GAA), a precursor of creatine, has emerged as one of the most promising supplements for ruminants in recent years. In its rumen-unprotected form, it is effective in different aspects of animal performance, but there are still no definitive studies on its ability to modulate reproductive responses. The objective of this study was to address this gap by investigating the action of GAA on ovarian function in sheep. Twenty-three sheep were allocated into three groups and fed a total mixed ration (TMR) for 23 days. The control group ($n = 6$) received the basal TMR diet; the GAA1 group ($n = 7$) received the same diet plus 0.9 g/kg DM of GAA daily; and the GAA2 group ($n = 7$) received 1.8 g/kg DM. Seven days after the start of supplementation, the sheep had their follicular wave synchronized with three prostaglandin doses administered every seven days. The GAA groups showed increased diet intake and reduced adipose deposits. GAA2 resulted in a higher number of follicles > 3 mm, greater intraovarian blood perfusion, and increased follicular diameter. At oocyte retrieval, the GAA groups showed lower peripheral glutathione peroxidase and, in oocytes, higher DCF and MT test intensities. In ovarian tissue, GAA2 showed higher expression of the AMH and CCND2 genes, while both GAA groups exhibited lower CYP19A1 and AKT1 transcript levels compared to

the control. We conclude that the direct use of GAA in the diet of sheep effectively enhances ovarian function and oocyte metabolic modulation.

Supplementation with rumen-protected fats reduces rectal temperature and improves productive performance of fattening lambs under heat stress

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Journal of Thermal Biology Volume 138, May 2026

DOI <https://doi.org/10.1016/j.jtherbio.2026.104458>

Highlights

- Supplementation with protected fat attenuates heat stress in fattening lambs.
- Adding 50 g d⁻¹ of protected fat in the rumen improves dry matter and water intake, with lower body temperature.
- Adding 100 g d⁻¹ of protected fat in the rumen negatively affects feed intake.
- The use of rumen-protected fat may be a viable feeding strategy to improve heat stress tolerance in fattening lambs.

Abstract

Heat stress significantly influences productivity, especially in arid regions where temperatures often exceed the thermoneutral limits of lambs. This study evaluates the effects of rumen-protected fat supplementation as a heat stress mitigation strategy on productive behavior and thermoregulation of Dorper lambs in a hot, dry climate. Twenty-one lambs were assigned to three treatments receiving 0, 50 and 100 g d⁻¹ of rumen-protected fat. For 13 weeks, data were collected on dry matter and water intake, body temperature (monitored by thermography and rectal measurements) and weight gain. Lambs receiving 50 g d⁻¹ of protected fat showed an increase ($P < 0.05$) in dry matter and water intake and experienced lower rectal and cephalic temperatures compared to the control group. However, the study noted that high levels of protected fat (100 g d⁻¹) could negatively affect intake. These results suggest that protected fat is a viable dietary strategy to improve heat tolerance in lambs, promoting productivity and welfare in adverse thermal environments. Likewise, the use of noninvasive thermography provided information on temperature variation in different regions of the body, although it was less sensitive to changes under conditions of mild heat stress.

Interactions of fecal egg count estimated breeding value and housing system on Katahdin lamb post-weaning performance

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Small Ruminant Research, Volume 258, May 2026 **OPEN ACCESS**

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Highlights

- Dry-lot lambs have improved production regardless of genetic parasite selection.
- Higher conception rates in dry-lot ewes may be attributed to increased health.
- Increased dry-lot input costs will likely be recovered with increased revenues.

Abstract

Genetic selection based on fecal egg count estimated breeding values (FEC EBV) and controlled environmental systems (confinement housing, nutritional supplementation, etc.) are potential methods to mitigate the impact of parasite burden in lambs. The objective here was to evaluate the result of divergent selection for parasite resistance (LowFEC vs. HighFEC) based on sire's and dam's EBVs on performance in two different management systems (confinement vs. pasture). Over two years [Year 1 (Y1) and Year 2 (Y2)], LowFEC EBV Katahdin ewes (Y1: n = 52; Y2: n = 40) were randomly bred to LowFEC EBV Katahdin rams (Y1: n = 3; Y2: n = 3) at the Virginia Tech Southwest Agricultural Research and Extension Center. HighFEC EBV Katahdin ewes (Y1: n = 48; Y2: n = 50) were randomly bred to HighFEC EBV Katahdin rams (Y1: n = 3; Y2: n = 3). Ewes across both genotypes in each year ranged from 2 to 7 years in age. Rams across both genotypes in each year ranged from 2 to 8 years in age. For genetic connectedness between years, one LowFEC sire and two HighFEC sires from Y1 were utilized in Y2. Prior to weaning (Y1: 76 d; Y2: 92 d), pairs of ewes and their lambs were managed on fescue-based pasture. After weaning, a subset of the lamb crop were randomly assigned to a dry-lot (Y1: LowFEC: n = 27, HighFEC: n = 24; Y2: LowFEC: n = 37, HighFEC: n = 40) or pasture (Y1: LowFEC: n = 26, HighFEC: n = 25; Y2: LowFEC: n = 37; HighFEC: n = 40) group. The dry-lot group received ad libitum supplementation of a concentrate pellet (16 % CP, 76 % TDN) via the C-Lock, Inc Super SmartFeeder (SSFeeder) while the pasture group was supplemented 2 % body weight via standard trough feeders. After 63 days in Y1 and 71 days in Y2, lamb eye muscle depth (EMD) was determined via ultrasound. Throughout the feeding trial, body weights, ADG, FEC, packed cell volume (PCV), and FAMACHA scores were collected approximately every 14 d. Statistical analyses were conducted using SAS with Proc MIXED with fixed effects of genotype (LowFEC vs. HighFEC), housing, sex, and time within year (the repeated factor). In Y2, LowFEC lambs had greater ADG than HighFEC lambs ($P < 0.05$) and dry-lot housed lambs had greater ADG than pasture raised lambs ($P < 0.01$). As anticipated, dry-lot lambs had greater EMD than pasture raised lambs in both years ($P < 0.01$). In both years, LowFEC EBV lambs had lower FECs compared to HighFEC EBV lambs ($P = 0.05$), and dry-lot lambs had lower FECs compared to pasture lambs ($P < 0.01$). No differences existed in the percentage of lambs dewormed across housing or genotypes. In Y2, approximately 24 % more lambs required deworming in the LowFEC pasture group than the LowFEC dry-lot group ($P < 0.05$) and 48 % more lambs were dewormed in the HighFEC pasture group compared to the HighFEC dry-lot group ($P < 0.05$). Improved survivability, health, and growth performance resulted in a greater number of dry-lot lambs (23 % more) to market at a greater weight. Survivability in each housing group was measured by the percentage of lambs successfully surviving to the end of the trial. These results indicate the potential of management systems to help mitigate genetic susceptibility to parasitism allowing improved health status and increased growth during the post-weaning period.

Embryo production, fertility and lambing rates following superovulation with purified porcine and recombinant human FSH in Shal ewes

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Small Ruminant Research, Volume 258, May 2026

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Highlights

- rhFSH could be a suitable alternative to porcine FSH for superovulation of ewes.
- The major findings were similar between rhFSH and porcine FSH.
- rhFSH may provide better recovery rate and embryo quality compared to porcine FSH.

Abstract

The objectives of this study were to evaluate the quantity and quality of embryos derived from superovulation with either purified porcine or recombinant human FSH (rhFSH) and to assess the fertility and lambing rate outcomes following embryo transfer in Shal ewes. Donors (n = 10) received norgestomet implants on Day 0 of experiment. Superovulation protocol was initiated on Day 8 with six injections of FSH administered every 12 h. Ewes in two groups received the respective rhFSH (600 IU Follitropin alfa) and highly purified porcine FSH (210 mg NIH), in decreasing doses. Two injections of prostaglandin F2 α analogue were administered coincided with the third and fourth FSH injections. Norgestomet implant was removed on Day 10 and GnRH analogue was administered on Day 11. Ewes underwent laparoscopic artificial insemination on Day 12 with fresh semen. Six days post-insemination, embryos were recovered and surgically transferred in pairs to synchronized recipient ewes. Data were analyzed using ANOVA, Poisson regression, and Chi-Squared tests. There was no difference in the respective number of corpora lutea, total number of ova/embryos and transferable embryos between groups: rhFSH (9.0 ± 3.03 , 8.4 ± 2.91 , 7.2 ± 2.74) and Porcine FSH (13.2 ± 2.69 , 8.8 ± 3.77 and 8.0 ± 3.56 ; $P > 0.05$). The respective embryo recovery rate and the survival rates were greater in ewes treated with rhFSH (93.3 %, 75.7 %) compared to Porcine FSH (66.6 %, 52.5 %; $P < 0.05$). In conclusion, both rhFSH and porcine FSH are effective for superovulation in ewes.

Evidence for greater fertility of ewes with longer anogenital distance (AGD)

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Highlights

- Anogenital distance (AGD) differed among sheep breeds.
- AGD was associated with parity in ewes.
- AGD was positively associated with pregnancy and lambing rate in sheep.

Abstract

Anogenital distance (AGD) has been recognized to be related to reproductive performance in various species; however, limited information is available in sheep. Therefore, the present study was conducted to investigate the association of AGD with reproductive variables in three breeds of sheep [i.e., Blanche du Massif Central (BMC), Romane and Lacaune; n = 666]. For this purpose, AGD was measured as the distance between anus and ventral commissure of the vulva by a caliper in the ewes before introduction to rams for mating. AGD was longer in Romane breed than BMC and Lacaune breeds, and it was longer in BMC than Lacaune breed ($P < 0.05$). Length of AGD also increased by parity ($P < 0.05$). Accordingly, for further analysis, ewes were categorized into ewes with short [ewes in the first quartile (Q1) range; n = 164], intermediate (ewes in the Q2 and Q3 range; n = 338) and long (ewes in the Q4 range; n = 164) AGD based on length of AGD within each breed and parity category. Pregnancy (77.44 % versus 66.46 %) and lambing (73.17 % versus 62.20 %) rates were greater in long AGD than short AGD ewes ($P < 0.05$). Moreover, pregnancy and lambing rates tended to be greater in ewes with long AGD than ewes with intermediate AGD (70.12 % and 66.86 %, respectively; $0.05 \leq P < 0.10$). Sex ratio of lambs (proportion of male lambs) also tended to be greater in ewes with long AGD (52.81 %) than ewes with intermediate AGD (44.82 %; $P = 0.087$). However, abortion rate, litter size and weight, and birth weight of lambs did not differ among various categories of AGD ($P > 0.05$). In conclusion, the present study showed a positive association of AGD with fertility in ewes, implicating that this phenotypic trait has the potential to be applied for reproductive management in sheep flocks. Yet the effect of breed and parity on AGD implies that it should be characterized in each breed considering parity of ewes before being used for further practical applications.

Characterizing neuroma-like formation after tail docking in sheep

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Research in Veterinary Science, Volume 205, June 2025 **OPEN ACCESS**

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Highlights

- Neonatal rubber ring docking caused neuroma-like lesions in the tail stump of lambs.
- Neuroma-like lesions in docked sheep ranged from mild to severe.
- Periosteal changes in docked tails may be an additional source of chronic pain.

Abstract

Tail docking is a routine husbandry procedure in lambs that causes acute pain. Studies of tail docking performed between 4 and 8 weeks of age have reported neuromas in the tail stump, which are characterized by aberrant nerve proliferation and fibrotic scarring and represent a potential source of chronic pain. However, it remains unclear whether similar lesions develop after rubber ring docking in the first week of life, the age at which this method is commonly recommended. This study examined the histological characteristics of tail stumps in lambs docked with a constrictive rubber ring at 1–2 days of age compared with undocked controls. Eighteen Polypay female lambs (8 docked, 10 undocked) were slaughtered at 7.5 to 8 months of age and their tails collected and decalcified for histology and immunohistochemistry. Tissues were evaluated for abnormalities characteristic of neuromas followed by blinded semi-quantitative scoring of key histologic features. Neuroma-like axon proliferation and fibrosis ranged from mild to severe and were significantly more severe in docked than undocked tails. In addition to neuromatous lesions in the soft tissue, axon proliferation was particularly prominent in the periosteum of the docked vertebral bone. Masson's trichrome staining showed that neural proliferation was accompanied by fibrosis, and immunohistochemistry confirmed that lesions included proliferation of both axons and Schwann cells, characteristic of traumatic neuromas. These findings provide evidence that tail docking with a rubber ring, even when performed at an early age, causes neuroma-like lesions, which may represent a source of chronic pain in sheep.

Upcoming events

Date	Event	Location
7 May 2026	Plan to Lamb AWI Extension NSW	Webinar
13 May 2026	MeatUp Forum Meat & Livestock Australia	Cooma, NSW
14 May 2026	Three's a crowd – practical tips for triplet success Meat & Livestock Australia PDS Updates	Webinar
5 June 2026	Feed budgeting Masterclass AWI Extension NSW	Gundagai, NSW
24 June 2026	Weaning planning for 2026 AWI Extension SA	Webinar