

TECHNICAL BULLETIN

Part 1

A happy cow is a productive cow

Lameness and reproductive efficiency: New research demonstrates long term benefits of a one-off treatment of METACAM¹

The key takeaway from this study is that while a single METACAM® 20 mg/mL Solution for Injection at the time of hoof-horn lameness diagnosis did not significantly reduce time to soundness, it did result in significant and substantial improvements in reproductive performance.

METACAM treated cows showed:



42% improvement in the hazard of conception



15% absolute increase in the 6-week in-calf rate and the final pregnancy status

The association between painful hoof-horn lesions, thickness of digital cushion and remodelling of the pedal bone suggests a causal relationship between hoof lameness and inflammation.^{2,3} This study correlates with previous studies that have shown that lameness can have a significant negative impact on reproduction.^{4,5}

METACAM is highly effective in relieving the inflammation and pain associated with inflammatory conditions. The current study highlights the significant reproductive benefits possible from treating the pain and inflammation associated with lameness using METACAM as part of a comprehensive lameness treatment plan, (particularly for hoof-horn lesions).

This is especially relevant considering the significant and quantifiable economic and productivity gains associated with improving fertility metrics such as 3-week submission rate and 6 week in-calf rate.

METACAM Treatment for hoof-horn lameness in cows: Impacts on soundness and reproduction

This technical bulletin summarises the findings of a randomised clinical interventional study conducted by Mason and Laidlaw, (2025). The study investigated the effects of METACAM treatment on time to soundness and reproductive outcomes in cows with hoof-horn lesions.

Background

Lameness is a significant welfare and economic concern in cattle worldwide. Hoof-horn lesions, including white-line disease and sole lesions, are a common cause of lameness in cows. While prevention is ideal, prompt and appropriate treatment can benefit individual cows and potentially prevent future lameness episodes.

Non-steroidal anti-inflammatory drugs (NSAID) are strongly indicated for optimal treatment of lame cows due to their pain-relieving and anti-inflammatory properties. However, widespread adoption by animal health professionals and farmers lags the growing evidence of clinical advantages and cost-benefit analyses.⁸

Previous research on NSAID treatment for hoof-horn lameness has produced varied results regarding its impact on lameness scores. Some studies have shown improvement in lameness cure risk with NSAID, particularly in combination with hoof blocks and when diagnosed early. However, other studies have found little benefit from NSAID in farmer-identified or chronic lameness cases.⁸

Study objectives

The study aimed to assess the impact of NSAID treatment with METACAM, on the following outcomes in dairy cows with hoof-horn lesions:

1. Time to lameness soundness after treatment with therapeutic trimming and block application
2. Reproductive success, including time to conception, pregnancy risk within 6 weeks of the breeding period, and final pregnancy status

The study hypothesised that METACAM treatment would be associated with:

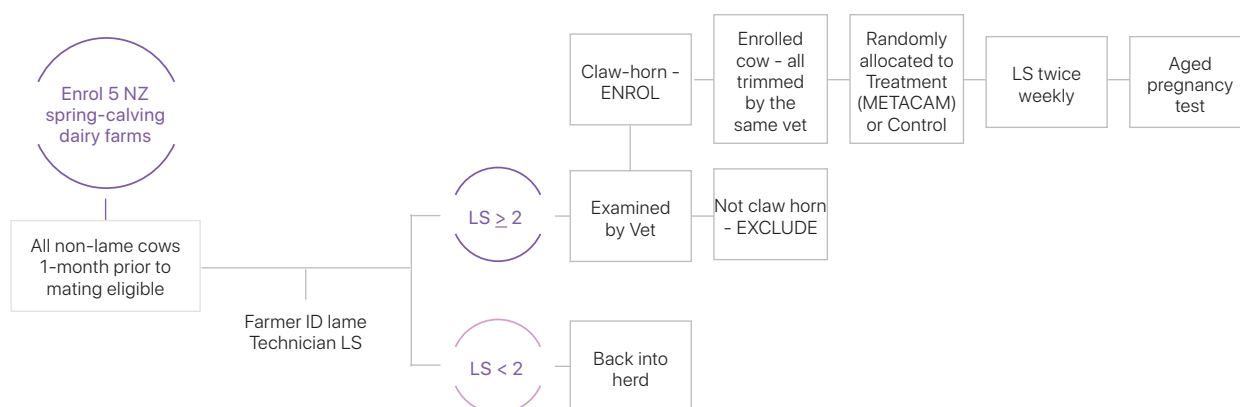
- Reduced time to soundness
- Improved reproductive performance

Study design

The study was conducted on five seasonal-calving, pasture-based dairy farms in the Waikato region of New Zealand. A total of 241 cows with lameness confirmed by a lameness score (LS) of ≥ 2 were enrolled in the study. Most of the cows had white-line lesions.

Enrolled cows received therapeutic hoof trimming and wooden block application to the non-lame hoof, following standard on-farm practice. Cows were randomly assigned to either a NSAID treatment group (METACAM) or a control group (no NSAID treatment).

The treatment group received a single subcutaneous injection of METACAM (0.5 mg/kg).





Data collection and analysis

Following treatment, cows were lameness scored on a median interval of every 4 days until they were considered sound (LS = 0). Blocks were assessed for retention up to 14 days after application. Reproductive data, including conception date and pregnancy status, were collected through rectal ultrasound. Statistical analyses were performed using Cox proportional hazard models for time-to-event outcomes and multi variable logistic regression for binary outcomes.

Results

The hazard ratio for time to soundness in METACAM-treated cows was 0.78 (95% CI 0.56 – 1.03) compared to control cows, but this difference was not statistically significant.

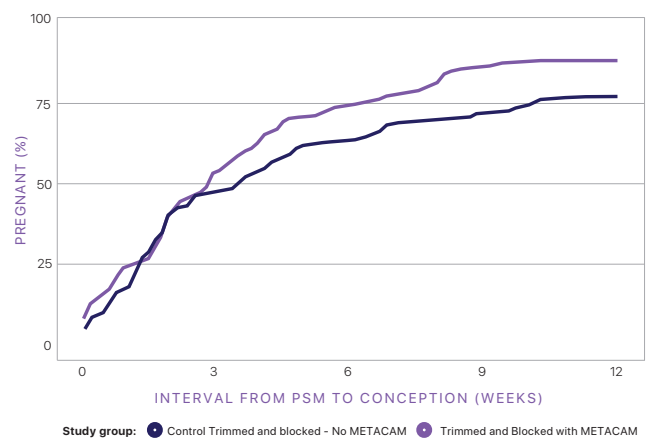
METACAM treatment was associated with significant improvements in reproductive performance, despite the lack of difference in time to soundness.

Specifically, METACAM treated cows had:

- 1.42 times the hazard of conception compared to control cows (95% CI 1.06 – 1.90)
- 15% absolute (10% relative) greater predicted probabilities of conceiving within the first 6 weeks of the breeding period ($P = 0.037$)
- 15% absolute (10% relative) greater predicted probabilities of final pregnancy status ($P = 0.019$)

The number of days from the herd start of mating to conception was also shorter for METACAM-treated cows compared to control cows.

Fertility results



Discussion

The study's significant findings suggest that METACAM treatment can significantly improve reproductive outcomes in dairy cows with hoof-horn lesions. The lack of association between METACAM treatment and time to soundness may be due to limitations of using lameness scores as a sole measure of treatment response, timing of lameness scoring relative to treatment duration, or other effects. Lameness scores may not be sensitive enough to detect the subtle improvements in cow mobility and comfort that NSAID can provide.^{8,9}

Reproductive benefits of METACAM

The most significant finding of this study is that these large reproductive effects happened in the face of no benefit to lameness scores and considerably later in the pathophysiology pathway, similar to findings in mastitis studies.^{6,7} The significant improvements in reproductive outcomes observed in this study support the working hypothesis that treating inflammation with METACAM, appears to have benefits potentially months later in mitigating the negative effects of lameness on reproductive performance. Similarly in studies investigating the effects of meloxicam added to mastitis treatment protocols,^{6,7} the anti-inflammatory effects of METACAM contributed to improved reproductive performance by reducing the pain and inflammation associated with mastitis, leading to better overall health, well-being, and longevity in the herd.

Study limitations

Lack of blinding:

Technicians were not blinded to treatment groups, potentially introducing bias in lameness scoring

Block retention not monitored after 14 days:

The presence or absence of blocks after 14 days could have confounded the relationship between METACAM and lameness score

Limited follow-up period:

Cows were only monitored until their first LS = 0, without further assessment of potential relapse or contralateral lameness

Focus on hoof-horn lesions:

The study only included cows with hoof-horn lesions, limiting the generalisability of the findings to other types of lameness

Geographically

the study focused on 5 farms in one region of NZ limiting the generalisability of the findings

Whilst the study had limitations none of these impacted the reproductive outcomes.

Conclusion

In this study METACAM treatment improved reproductive performance in dairy cows with hoof-horn lesions. The findings highlight the importance of adding METACAM to lameness treatment to mitigate the negative consequences of lameness on cow health, reproduction, and productivity. The results suggest that in the absence of compelling reasons not to, every lame cow should receive pain relief, (METACAM) in addition to standard treatment protocols. Using existing gap calculators to demonstrate the financial benefit to veterinarians is likely to increase the confidence in recommendation and subsequent adoption of METACAM by farmers.



1. Mason, W.A. *et al.*, The effect of meloxicam at the time of treatment of hoof-horn lameness in pasture-grazing dairy cattle on time to lameness soundness, pregnancy risk, and time to conception: A randomized control trial. *J. Dairy Sci.* 108(4):3991 - 4004. 2. Newsome, R., *et al.* (2016) Linking bone development on the caudal aspect of the distal phalanx with lameness during life. *J. Dairy Sci.* 99(6):4512-4525. 3. Wilson, J. P., *et al.* (2021). A history of lameness and low body condition score is associated with reduced digital cushion volume, measured by magnetic resonance imaging, in dairy cattle. *J. Dairy Sci.* 104(6):7026-7038. 4. Alawneh, J.I., Laven, R.A., & Stevenson, M.A. (2011, November). The effect of lameness on the fertility of dairy cattle in a seasonally breeding pasture-based system. *J. Dairy Sci.* 94(11), 5487-5493. <https://doi.org/10.3168/jds.2011-4395>. 5. Garvey, M. (2022, March). Lameness in Dairy Cow Herds: Disease Aetiology, Prevention and Management. *Dairy*, 3(1), 199-210. <https://doi.org/10.3390/dairy3010016>. 6. McDougall, S., *et al.* (2016). Addition of meloxicam to the treatment of clinical mastitis improves subsequent reproductive performance. *J. Dairy Sci.*, 99: 2026-2042. 7. McDougall, S., *et al.* (2009). Effect of treatment with the nonsteroidal anti-inflammatory meloxicam on milk production, somatic cell count, probability of re-treatment, and culling of dairy cows with mild clinical mastitis. *J. Dairy Sci.*, 92: 4421-4431. 8. Mason, W. A., Cuttance E.L., *et al.* (2022). Graduate Student Literature Review: A systematic review on the associations between non steroidal anti-inflammatory drug use at the time of diagnosis and treatment of claw horn lameness in dairy cattle and lameness scores, algometer readings, and lying times. *J. Dairy Sci.* 105: 9021-9037. 9. Afonso, J., Bruce, *et al.*, (2020). Profiling Detection and Classification of Lameness Methods in British Dairy Cattle Research: A Systematic Review and Meta-Analysis. *Frontiers in Veterinary Science*, 7. <https://doi.org/10.3389/fvets.2020.00542>. 10. To view a copy of the reviewed paper and site references from the paper please click here

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