Email: biovetinnovator@gmail.com Official Website: https://biovetinnovator.in/
Fueling The Future of Science… ISSN: 3048-8397

Bio Vet Innovator Magazine
(Fueling The Future of Science…)
Volume 3 (Issue 5) MAY 2026
OPEN ACCESS International Day for Biological Diversity – 22th May Popular Article

Unveiling The Complexity of Retained Fetal Membranes in Bovines: Emerging Therapeutic Trends in Field Conditions

Dr. Shubham Nayak[1*], Dr. Abhishek Tiwari[2], Dr. Vaidehi Mishra[3] and Dr. Komal[4]
1Ph.D. Scholar, Animal Reproduction, Gynaecology and Obstetrics,
ICAR-National Dairy Research Institute (NDRI), Karnal-132001, Haryana, India
2Ph.D. Scholar, Animal Nutrition Division,
ICAR-National Dairy Research Institute (NDRI), Karnal-132001, Haryana, India
3Ph.D. Scholar, Department of Livestock Production Management,
College of Veterinary & Animal Sciences, SVPUAT, Meerut-250110, U.P., India
4Ph.D. Scholar, Animal Nutrition Division,
ICAR-National Dairy Research Institute (NDRI), Karnal-132001, Haryana, India
***Corresponding Author:** nayakshubham962@gmail.com
DOI: https://doi.org/10.5281/zenodo.20355947

Received: May 10, 2026
Published: May 15, 2026

Abstract:

Retained fetal membranes (RFM) is a major postpartum reproductive disorder in bovines characterized by failure to expel fetal membranes within 12 hours after calving. It causes economic losses through reduced milk yield, infertility, delayed uterine involution, prolonged calving interval, treatment costs, and increased culling. The condition is multifactorial, involving hormonal imbalance, impaired immune response, nutritional deficiencies, placental immaturity, and uterine atony. Predisposing factors include dystocia, abortion, twin pregnancy, hypocalcemia, infectious diseases, induced parturition, and advanced parity. Modern management emphasizes evidence-based approaches including selective antibiotic therapy, hormonal treatment, uterine lavage, and anti-inflammatory drugs while discouraging indiscriminate manual removal. Emerging therapeutic concepts such as collagenase therapy, ozone therapy, immunomodulation, and targeted nutritional supplementation are increasingly being explored for the management of RFM. Preventive strategies focusing on transition nutrition, metabolic health, immune competence, and proper calving management remain essential for minimizing RFM in bovines.

Keywords: Antibiotic therapy, Bovines, Collagenase therapy, Immunomodulation, Retained fetal membranes

Introduction:

Retention of fetal membranes (RFM), commonly called retained placenta, is a frequent postpartum reproductive disorder in bovines defined as failure to expel fetal membranes within 12 hours after calving. Normally, placental expulsion occurs within 6 hours through coordinated uterine contractions and loss of fetomaternal adherence. The condition is associated with reduced milk yield, infertility, delayed uterine

involution, increased calving interval, treatment expenses, and culling. RFM is multifactorial, involving hormonal imbalance, impaired immune response, oxidative stress, nutritional deficiencies, and placental immaturity. Recent research emphasizes understanding its pathogenesis and preventive strategies for better reproductive health management.

Understanding Retained Fetal Membranes:

The bovine placenta is cotyledonary, where fetal cotyledons attach to maternal caruncles forming placentomes. Normally, hormonal and enzymatic changes weaken these attachments for placental expulsion. Failure of this process results in RFM. Placental expulsion generally occurs within 3–8 hours, while retention beyond 12 hours is considered pathological. RFM may occur as primary retention (failure of separation) or secondary retention (failed expulsion due to uterine atony).

Rfm: A Major Concern

RFM predisposes bovines to reproductive and metabolic disorders because retained membranes favor bacterial growth and uterine infection. Major complications include metritis, endometritis, delayed uterine involution, reduced conception rate, ketosis, mastitis, reduced milk production, and increased culling, causing significant economic losses.

Major Risk Factors:

Major risk factors include dystocia, abortion, premature parturition, twin pregnancy, hypocalcemia, nutritional deficiencies (Vitamin E, Selenium, Vitamin A), hormonal imbalance, infectious diseases, induced parturition, advanced parity, and previous history of RFM.

Physiology Of Placental Separation:

Normal placental expulsion involves endocrine, enzymatic, immune, and mechanical mechanisms. Near parturition, hormonal changes stimulate uterine contractions, while collagenase enzymes and immune cells facilitate placental detachment. Weak uterine contractions may result in secondary retention.

Clinical Signs And Diagnosis:

Clinical signs include hanging fetal membranes, foul-smelling discharge, fever, reduced appetite, lowered milk yield, and delayed uterine involution. Diagnosis is based on recent calving history, persistence of membranes beyond 12 hours, clinical examination, and systemic assessment. Haemato-biochemical alterations may also be observed.

Modern Therapeutic Approaches:

Current evidence discourages forceful manual removal because of its association with uterine injury, delayed healing, and poor reproductive performance. Systemic antibiotics are generally advised in animals showing fever, fetid discharge, or signs of metritis. Hormonal agents, uterine lavage, and non-steroidal anti-inflammatory drugs (NSAIDs) such as flunixin meglumine help improve uterine clearance,

reduce inflammation, and support postpartum recovery. A selective and case-based treatment approach is increasingly preferred to achieve better reproductive outcomes.

Emerging Concepts & Prevention:

Newer therapeutic strategies such as collagenase therapy, ozone therapy, immunomodulation, and targeted nutritional supplementation are receiving increasing attention in RFM management. These approaches are aimed at facilitating placental detachment, improving uterine environment, strengthening immune response, and minimizing postpartum complications. In particular, nutritional support through antioxidants and essential trace minerals during the transition period may help improve resistance against RFM. Preventive measures including balanced nutrition, proper calving management, timely control of metabolic disorders, cautious use of induced parturition, and maintenance of immune competence remain crucial for lowering the occurrence of RFM in bovines.

Future Perspectives:

Future advances are expected in molecular understanding of placental detachment, biomarkers, immunotherapeutics, targeted enzyme therapy, and precision reproductive management.

Conclusion:

Retained fetal membranes remain an important postpartum reproductive disorder in bovines affecting fertility, milk production, and farm economics. The condition results from interactions among hormonal imbalance, immune dysfunction, nutritional deficiencies, and impaired placental maturation. Current evidence supports selective, evidence-based therapy, while prevention through nutrition, immune health, metabolic stability, and proper calving management remains the most sustainable approach.

References:

Amin, R. U., Bhat, G. R., Ahmad, A., Swain, P. S. and Arunakumari, G. (2013). Understanding patho-physiology of retained placenta and its management in cattle-a review. Veterinary Clinical Science. 1(1): 1-9.

Beagley, J. C., Whitman, K. J., Baptiste, K. E. and Scherzer, J. (2010). Physiology and treatment of retained fetal membranes in cattle. Journal of veterinary internal medicine. 24(2): 261-268.

Drillich, M., Mahlstedt, M., Reichert, U., Tenhagen, B. A. and Heuwieser, W. (2006). Strategies to improve the therapy of retained fetal membranes in dairy cows. Journal of dairy science. 89(2): 627-635.

Fesseha, H. (2020). Retained Fetal Membrane in a Dairy Cow and its Management Option. EC Clinical and Medical Case Reports. 3: 35-38.

Fthenakis, G. C. (2004). Effects of retention of fetal membranes on subsequent reproductive performance of dairy ewes. Theriogenology. 61(1): 129-135.

Ganaie, B. A., Japheth, K. P., Ali, M., Lone, S. A., Mir, S. H. and Malik, T. A. (2018). An insight into the

pathophysiology, preventive and treatment strategies of retained fetal membranes in bovines–a review. J. Anim. Health Prod. 6(2): 62-72.

Gross, T. S., Williams, W. F. and Moreland, T. W. (1986). Prevention of the retained fetal membrane syndrome (retained placenta) during induced calving in dairy cattle. Theriogenology. 26(3): 365-370.

Hanzen, C. and Rahab, H. (2024). Propaedeutic and therapeutic practices used for retained fetal membranes by rural European veterinary practitioners. Animals. 14(7): 1042.

Hossain, M. K., Billah, M. N., Aziz, S. A., Rahman, M. A., Islam, M. N., Muslehuddin, A. H. M., Lucky, N.S., Hossain, M. M., Aktaruzzaman, M. and Islam, M. R. (2015). Factors affecting retained fetal membrane and its therapeutic management in dairy cows. International Journal of Natural Sciences. 5(2): 93-97.

Patel, R. V. and Parmar, S. C. (2016). Retention of fetal membranes and its clinical perspective in bovines. Sch J Agric Vet Sci. 3(2): 111-116.

Rajoriya, J. S., Kumar, R., Singh, A. P. and Chauhan, P. M. (2025). Retained placenta and fetal membranes. Elements of Reproduction and Reproductive Diseases of Goats. 393-399.

Rao, T. K. S., Kumar, B., Chaurasia, S., Sharma, V. K., Baishya, A., Singh, A. and Patel, N. B. (2018). Fetal Membranes and Associated Complications in Dairy Animals: A Review. Theriogenology Insight. 8(3): 125-136.

Skuja, S. and Antāne, V. (2017). Effects of the treatment method of reproductive performance in cows with retention of fetal membranes.

Thulasiraman, S., Gunasekar, M., Subramanyam, P. N. B. and Narayanasamy, A. (2024). Retained Fetal Membranes: A Review. Periparturient Diseases of Cattle. 87-92.

Zubair, M. and Ahmad, M. (2014). An insight into the recent advances on the physiology and treatment of retention of fatal membranes in cattle. Adv. Anim. Vet. Sci. 2(2): 73-77.