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Evaluation of uterotone 3-in-1 for improvement of peri-parturient health, uterine recovery and milk production in dairy animals: A multi-centre field study

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Abstract

Background: The transition period around calving represents a critical phase affecting reproductive efficiency and productivity in dairy animals. Metabolic disorders, retained placenta and delayed uterine involution during this phase significantly compromise subsequent fertility and milk production.

Objective: The present multi-centre field study was conducted to evaluate the efficacy of Uterotone 3-in-1, a peri-parturient supportive formulation, in improving uterine health, metabolic stability, and milk yield in dairy cows and buffaloes under diverse field conditions.

Materials and Methods: A total of 51 dairy animals (32 cows, 8 buffaloes, 11 unspecified) with a mean age of 5.07 ± 1.64 years and mean lactation number of 2.50 ± 0.95 were included across multiple veterinary centres. Animals were administered Uterotone 3-in-1 during the peri-parturient period at 300–900 ml/day for a mean duration of 3.56 ± 1.13 days. Parameters recorded included placental expulsion time, lochial discharge quality, milk yield changes, fat content, and general health status.

Results: Timely expulsion of placenta (100%), normal lochial discharge (100%), and improved general wellness (100%) were recorded in all treated animals. Among animals where milk yield data was available ($n=40$), a mean increase of 541.00 ± 385.89 ml/day (median: 500 ml/day) was observed during early lactation. Fat content improvement was reported in 88.2% of cases. All participating veterinarians (100%) expressed satisfaction with the product and recommended its use.

Conclusion: Peri-parturient supplementation with Uterotone 3-in-1 was associated with favourable reproductive recovery, enhanced milk production, and high veterinarian satisfaction under practical field conditions. These findings warrant further investigation through controlled randomised trials.

Keywords: Peri-parturient period, uterine involution, dairy cow, buffalo, milk yield, field trial, Uterotone 3-in-1, retained placenta

1. Introduction

The peri-parturient period, spanning approximately three weeks before to three weeks after calving, is recognised as one of the most physiologically demanding phases in the productive life of dairy animals. During this transition, animals undergo profound metabolic, hormonal, and immunological changes that predispose them to a range of clinical and subclinical disorders including hypocalcaemia (milk fever), ketosis, retained fetal membranes (RFM), metritis, and endometritis (Drackley, 1999; LeBlanc *et al.*, 2006) ^[1, 3].

Retained placenta, defined as failure to expel fetal membranes within 12 hours of parturition, is reported in 5–15% of dairy cattle globally and is a significant risk factor for subsequent metritis and reduced fertility (Drillich *et al.*, 2006) ^[2]. Delayed uterine involution further compounds reproductive inefficiency by extending the interval from calving to first service and reducing conception rates (Sheldon *et al.*, 2008) ^[6].

The economic impact of peri-parturient disorders is substantial, encompassing direct treatment costs, reduced milk production, extended calving intervals, and increased culling rates. Strategies aimed at supporting metabolic adaptation and uterine recovery during this critical window are therefore of considerable practical importance in dairy herd management (Overton

and Waldron, 2004).^[5]

Uterotone 3-in-1 is a proprietary peri-parturient supportive formulation designed for oral administration before and after calving. It is formulated to enhance uterine tone, facilitate timely expulsion of fetal membranes, support metabolic adaptation, and promote early lactation performance. The present multi-centre field study was undertaken to evaluate its effectiveness under practical farm conditions across diverse geographic locations, management systems, and animal types in India.

2. Materials and Methods

2.1 Study Design and Location

This was a prospective, multi-centre, open-label field study conducted between October 2025 and February 2026 across multiple veterinary centres in the states of Rajasthan, Punjab, Jammu & Kashmir, Bihar, Haryana, Uttar Pradesh, and Maharashtra, India. The study was designed to evaluate the field efficacy of Uterotone 3-in-1 under routine farm management conditions.

2.2 Animal Selection and Enrolment

A total of 51 dairy animals comprising 32 cows, 8 buffaloes, and 11 animals of unspecified species were enrolled in the study. Animals were maintained under routine management practices at their respective farms. The mean age of enrolled animals was 5.07 ± 1.64 years (range: 2.0–9.0 years) with a mean lactation number of 2.50 ± 0.95 (range: 1–5).

Table 1: Demographic Characteristics of Study Animals (N=51)

Parameter	Mean $\pm$ SD	Median	Mode	Range
Age (years)	5.07 ± 1.64	5.0	4.0	2.0–9.0
Lactation Number	2.50 ± 0.95	2.0	2.0	1–5
Treatment Duration (days)	3.56 ± 1.13	3.0	3.0	1–6
Total Dose (ml)	919.00 ± 310.19	900	900	250–1800

SD = Standard Deviation. Age data available for 45 animals; lactation data for 44 animals.

2.3 Treatment Protocol

Animals were administered Uterotone 3-in-1 orally during the peri-parturient period according to the following recommended dosage schedule:

1. Pre-calving dose: 300 ml administered prior to expected calving date
2. Post-calving dose: 300 ml administered 12 hours after calving
3. Continuation dose: 300 ml/day for 2–4 days post-calving
4. Extended protocol: Up to 900 ml/day in select cases based on clinical assessment and veterinary recommendation

2.4 Parameters Recorded

The following parameters were systematically recorded by field veterinarians for each enrolled animal:

5. Timeliness of placental expulsion (within 12 hours of parturition)
6. Quality and duration of lochial discharge
7. Change in daily milk yield (ml/day) during early lactation
8. Fat content improvement
9. General health and wellness assessment
10. Veterinarian satisfaction and recommendation

2.5 Data Analysis

Descriptive statistics including mean, standard deviation, median, mode, and range were computed for continuous

variables. Categorical outcomes were expressed as frequencies and percentages. Data were analysed using standard statistical methods.

3. Results

3.1 Study Population

A total of 51 dairy animals were enrolled and completed the study protocol. The species distribution comprised 62.7% cows (n=32), 15.7% buffaloes (n=8), and 21.6% unspecified (n=11). The demographic characteristics are summarised in Table 1 and Figure 1.

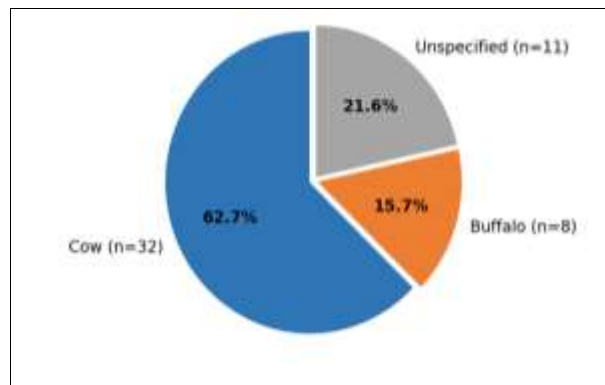


Fig 1: Distribution of Dairy Animals by Species (N=51)

3.2 Clinical Outcomes

All 51 treated animals (100%) demonstrated timely expulsion of placenta within the physiological time frame following parturition. Normal lochial discharge, indicative of satisfactory uterine clearance and involution, was observed in all cases (100%). Improvement in general health and wellness was reported for all animals (100%). No adverse reactions or side effects were reported during the entire supplementation period.

Table 2: Clinical Outcomes Following Uterotone 3-in-1 Administration (N=51)

Parameter	Yes (n)	No (n)	Percentage (%)
Timely Placenta Expulsion	51	0	100.0
Normal Lochial Discharge	51	0	100.0
Improved General Wellness	51	0	100.0
Fat Content Improvement	45	6	88.2
Increased Milk Production	40*	0	100.0*
Veterinarian Satisfaction	51	0	100.0
Veterinarian Recommendation	51	0	100.0

*Of 40 animals where milk yield data was available and quantifiable.

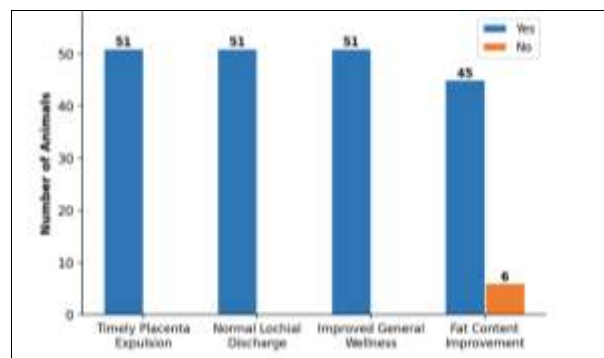


Fig 2: Clinical Outcomes Following Uterotone 3-in-1 Administration (N=51)

3.3 Milk Yield Response

Among the 40 animals for which quantifiable milk yield data was available, a mean increase of 541.00 ± 385.89 ml/day (median: 500 ml/day; mode: 500 ml/day) was recorded during early lactation following Uterotone 3-in-1 supplementation. The range of milk yield increase varied from 100 ml/day to 2000 ml/day. The distribution of milk yield responses is presented in Table 3 and Figure 2.

Table 3: Distribution of Milk Yield Increase Following Treatment (n=40)

Milk Yield Increase (ml/day)	Number of Animals	Percentage (%)
100–300	11	27.5
301–500	18	45.0
501–800	7	17.5
801–1000	2	5.0
>1000	2	5.0
Total	40	100.0

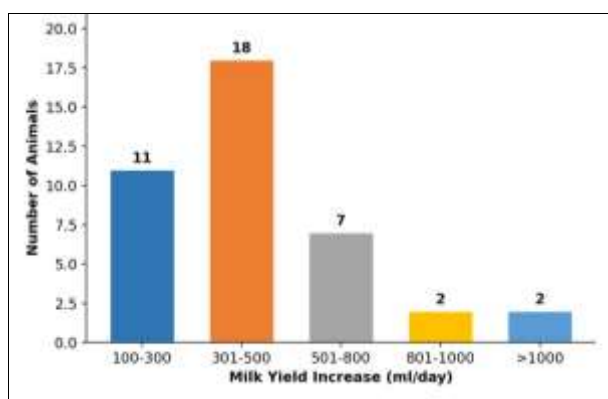


Fig 3: Distribution of Milk Yield Increase Following Uterotone 3-in-1 Treatment (n=40)

3.4 Treatment Duration and Dosage

The mean treatment duration was 3.56 ± 1.13 days (median: 3 days; range: 1–6 days). The majority of animals (52.0%, n=26) received treatment for 3 days, while 30.0% (n=15) received treatment for 5 days. The mean total dose administered was 919.00 ± 310.19 ml (median: 900 ml; range: 250–1800 ml). The most common dosing regimen was 900 ml total (64.0% of cases).

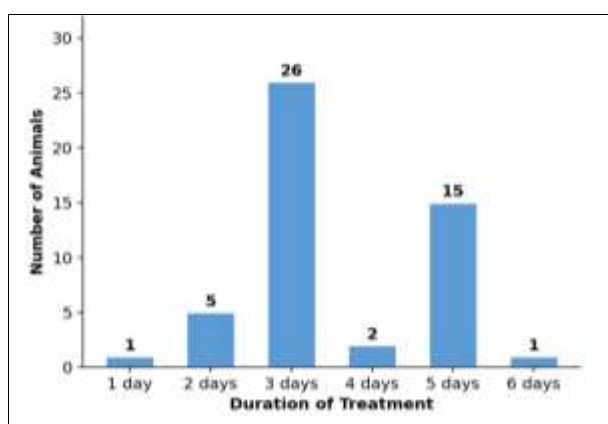


Fig 4: Distribution of Treatment Duration (n=50)

3.5 Veterinarian Assessment

All 51 participating field veterinarians (100%) expressed satisfaction with the clinical response observed following Uterotone 3-in-1 administration. Furthermore, all veterinarians (100%) indicated that they would recommend the product for use in peri-parturient dairy animals under

routine farm conditions.

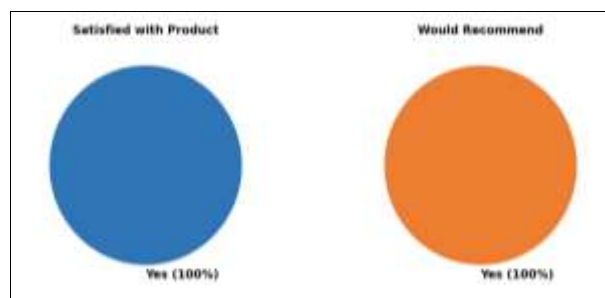


Fig 5: Veterinarian Satisfaction and Recommendation (N=51)

Table 4: Summary Statistics of Milk Yield Increase (n=40)

Statistic	Value (ml/day)
Mean $\pm$ SD	541.00 ± 385.89
Median	500.00
Mode	500.00
Minimum	100.00
Maximum	2000.00
Animals with Data Available	40 of 51 (78.4%)

4. Discussion

The peri-parturient period presents a significant management challenge in dairy production systems. The present multi-centre field study demonstrated that oral supplementation with Uterotone 3-in-1 during this critical phase was associated with favourable outcomes across all evaluated parameters in 51 dairy animals maintained under diverse field conditions.

The observation of 100% timely placental expulsion in all treated animals is noteworthy, given that the reported incidence of retained fetal membranes in dairy cattle ranges from 5–15% globally (Drillich *et al.*, 2006) [2]. While the absence of a concurrent control group precludes definitive causal attribution, the complete absence of retained placenta across a geographically diverse study population suggests a positive contribution of the formulation to uterine contractility and placental detachment processes.

The uniform observation of normal lochial discharge in all treated animals indicates satisfactory uterine involution and clearance. Efficient uterine involution is a critical determinant of subsequent fertility, as delays in this process are commonly associated with bacterial contamination, endometritis, and prolonged calving-to-conception intervals (Sheldon *et al.*, 2008; LeBlanc, 2010) [6, 3].

The mean milk yield increase of 541 ml/day (approximately 0.5 litres/day) observed in animals with available data represents a practically significant improvement with direct economic implications for dairy farmers. The majority of animals (72.5%) demonstrated increases in the range of 100–500 ml/day, while 10% showed increases exceeding 800 ml/day. This response variability likely reflects differences in breed, parity, nutritional status, management practices, and baseline production levels across study sites.

Fat content improvement was reported in 88.2% of cases, suggesting that the formulation may also contribute to improved milk quality parameters. This finding aligns with the hypothesis that enhanced metabolic stability during the transition period supports both quantity and quality of milk production (Drackley, 1999) [1].

The 100% veterinarian satisfaction and recommendation rate reflects the practical acceptance of the formulation under routine clinical conditions. This high level of endorsement from experienced field practitioners provides valuable

evidence of practical utility beyond numerical outcome measures.

It is important to acknowledge several limitations of the present study. The open-label, uncontrolled design without a placebo group limits the ability to establish causality. The multi-centre nature, while enhancing generalisability, introduces variability in management practices, data recording methods, and animal types. Milk yield data was not available for all animals, and milk yield measurements relied on farmer records rather than standardised metered measurements.

Despite these limitations, the consistent positive trend across multiple centres, species, and management systems provides encouraging preliminary evidence. The sample size of 51 animals, while modest, exceeds many previously reported field studies of peri-parturient supplements. The geographic diversity spanning seven Indian states enhances the external validity of the findings.

Further controlled, randomised, double-blind studies with larger sample sizes, standardised measurement protocols, and concurrent negative control groups would be valuable to establish statistical significance, determine dose-response relationships, and validate these preliminary field observations under more rigorous experimental conditions.

5. Conclusion

Administration of Uterotone 3-in-1 during the peri-parturient period was associated with timely placental expulsion (100%), satisfactory uterine clearance (100%), improved general wellness (100%), increased milk production (mean 541 ml/day), and improved fat content (88.2%) in dairy animals under diverse field conditions across multiple Indian states. Complete veterinarian satisfaction (100%) and universal recommendation for continued use further support the practical applicability of the formulation. Uterotone 3-in-1 may be considered a useful supportive management aid for improving peri-parturient health, reproductive recovery, and productivity in dairy animals. Controlled clinical trials are warranted to further substantiate these findings.

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