

Original Research Article

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Efficacy of FinaBan 102 (Pure Calcium Propionate) in Transition Period of Buffaloes (*Bubalus bubalis*)

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ABSTRACT

The present study aimed to evaluate the efficacy of FinaBan 102 (Pure Calcium Propionate) supplementation in transition period in Buffaloes with respect to metabolic disorders such as milk fever, ketosis, udder development and post-calving performance under field conditions. The study was conducted at Noble Dairy Farm, Aarey colony, Mumbai, Maharashtra, India. A total of 100 buffaloes were selected based on a similar physical condition and divided into control and treatment group each having 50 animals. The experiment was conducted for 3 months, i.e. Sept. 2025-Nov.2025, with an adaptation period of 15 days. In each month, during first 15 days, animals were supplemented with FinaBan 102 at 25 gms animal⁻¹ day⁻¹. During last 15 days i.e. 16-30 days, the animals were supplemented with 50 gms animal⁻¹ day⁻¹. Then, the results were compared with animals who did not receive FinaBan 102 (Pure Calcium Propionate) supplementation. The supplement was mixed uniformly with the daily ration. All other management and feeding practices remained unchanged during the study period. Supplementation with FinaBan 102 reduced the incidence of ketosis by 50%, milk fever by 100%, mastitis by 50%, and Retention of Placenta by 75%. Compared to the control group, the number of cases decreased from 2 to 1 for ketosis, 3 to 0 for milk fever, 2 to 1 for mastitis, and 4 to 1 for Retention of Placenta.

Keywords

FinaBan 102, buffaloes, milk fever, ketosis, lateral recumbency, hypocalcemia

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Introduction

In dairy industry, there are many challenges or critical situations which include Milk fever / hypocalcemia, Ketosis which is caused due to Negative Energy Balance (NEB). Also, these situations ultimately lead to reduction in the feed intake, production loss etc. Milk fever is particularly caused due to low serum calcium levels post-partum. Once the animal starts lactating, they tend to lose

calcium from milk. Ketosis is another metabolic disorder which affects overall health condition of the animals. To deal with this, it is very important to supply the dairy animals with feed supplements at appropriate dosages

FinaBan 102 (Pure Calcium Propionate) is a Pure Calcium Propionate through which we can supply calcium and energy at the same time. Also, it works well in calves for proper rumen development wherein

absorption of nutrients ensures proper weight gain. Therefore, present field trial was undertaken to evaluate the efficacy of FinaBan 102 during the transition period in buffaloes (*Bubalus bubalis*) with respect to metabolic disorders like milk fever and ketosis, udder development, and post-calving performance.

Propionic acid, produced by hydrolyzing calcium propionate and generated under acidic rumen conditions, is taken up by the rumen epithelium, transported to the liver via the portal vein, and converted into glucose. In lactating cows, propionate serves as the primary glucose precursor, and hepatic clearance of propionate accounts for as much as 60% of the glucose released by the liver (Duplessis *et al.*, 2017)

Propionate is an essential anaplerotic substrate for the tricarboxylic acid (TCA) cycle (Maldini *et al.*, 2019). It enters the TCA cycle via succinate, supplying carbon atoms that can either stay within the cycle or be withdrawn for gluconeogenesis (White H M 2015).

The main objectives of this study to evaluate the efficacy of FinaBan 102 (Pure Calcium Propionate) during the transition period in buffaloes (*Bubalus bubalis*) with respect to metabolic disorders like milk fever and ketosis, udder development, and post-calving performance.

Materials and Methods

Experimental sites and animals

The study was conducted at Noble Dairy Farm, Aarey colony, Mumbai, Maharashtra, India. A total of 100 buffaloes were selected based on a similar physical condition to minimize the biological variations. Two groups were made, one control and another treatment group each having 50 animals.

Experimental design and feeding

The experiment was conducted for 3 months, i.e. Sept. 2025-Nov.2025, with an adaptation period of 15 days. In each month, during first 15 days, animals were supplemented with FinaBan 102 at 25 gms animal⁻¹ day⁻¹. During last 15 days i.e. 16-30 days, the animals were supplemented with 50 gms animal⁻¹ day⁻¹. Then, the results were compared with animals who did not receive FinaBan 102 supplementation. The supplement was mixed uniformly with the daily ration.

All other management and feeding practices remained unchanged during the study period.

Data collection

Data was analyzed for the cases of milk fever, ketosis, mastitis and Retention of Placenta (ROP) in control and treatment group

Experimental Design

Duration	Feeding Regime
Day 1–15	Regular feed + FinaBan 102 @ 25 g /day/animal
Day 16–30	Regular feed + FinaBan 102 @ 50 g /day/animal

FinaBan 102 was mixed uniformly into the daily ration.

Parameters studied

- Cases of milk fever
- Cases of Ketosis
- Udder development and mastitis
- ROP (Retention of Placenta) cases

Results and Discussion

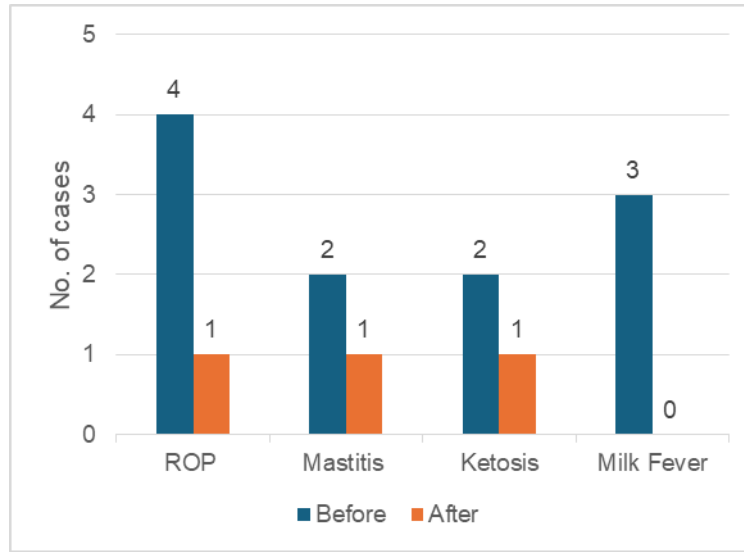
The animals who were supplemented with FinaBan 102 showed reduction in the cases of Ketosis by 50%, Milk fever by 100%, mastitis by 50%, Retention of Placenta by 75%.

When compared with the data where animals were not fed FinaBan 102, the reduction in the cases of ketosis, milk fever, mastitis and Retention of Placenta were observed from 2 to 1, 3 to 0, 2 to 1 and 4 to 1 respectively

Reduction in the milk fever cases

Milk fever is a metabolic disorder that manifests with clinical signs caused by a drop in blood calcium levels (hypocalcaemia) around the time of calving, primarily affecting high-producing, multiparous cows (Montero *et al.*, 2018). It ranks among the most frequent periparturient problems in dairy cattle (Neves *et al.*, 2018).

Fig.1 Reduction in the cases of ROP, Mastitis, Ketosis and Milk fever



Sr No	Parameter	Control	Treatment	% Reduction
1	ROP cases out of 100 buffalos	4	1	75
2	Mastitis cases	2	1	50
3	Ketosis	2	1	50
4	Milk Fever	3	0	100
5	Loss of Milk	4	1	75
6	Sale of Animal	2	0	100
7	Udder development Days before calving	4 days	Can see from 12 days	Significant improvement
8	Average time for expulsion of placenta after calving	7-8 hrs	3-4 hrs	Significant improvement
9	Days for peak milk production after calving	10days	5 days	Faster recovery

The condition can reduce dry-matter intake, lower milk yield, and impair reproductive performance, while also raising the likelihood of secondary ailments such as ketosis, retained placenta, displaced abomasum, mastitis, as well as increasing the occurrence of dystocia and uterine disorders (Mulligan *et al.*, 2006, Goff J. P 2008). When blood calcium falls beneath a critical level, both clinical and subclinical forms of milk fever may develop (Goff J. P 2008, Curtis *et al.*, 1983).

In the present study, the cases of milk fever were reduced from 3 to 0 which is 100% reduction rate. These results were similar with the Goff *et al.*, 1996 reported that administering calcium propionate markedly lowered the occurrence of milk fever in dairy herds experiencing a high prevalence of the disorder. Pehrson *et al.*, 1998

demonstrated that the incidence of milk fever in cows with a history of the condition was 25.3% when treated with calcium propionate (120 g total calcium), compared to 36.0% in untreated cows. Similarly, Kara *et al.*, 2009 reported that administering two doses of 0.68 kg of calcium propionate—one at calving and another 24 hours later—was effective in treating milk fever.

Reduction in the ketosis cases

Metabolic disorders such as fatty liver and ketosis arise from severe glucose deficiency, which triggers excessive mobilization of body fat. Moreover, during the perinatal period dairy cows reduce their dry-matter intake because the expanding fetus diminishes rumen volume and hormonal changes occur (Ingvarsen, K.L. & Andersen,

J.B. 2000). Metabolic or infectious diseases including fatty liver syndrome and ketosis—affect dairy cow productivity during the perinatal phase (Abdel-Latif *et al.*, 2016) and further influence animal welfare, productive lifespan, and economic outcomes (Ceciliani *et al.*, 2018).

Propionate can directly regulate its own metabolism in isolated bovine hepatocytes by upregulating the mRNA expression of cytosolic phosphoenolpyruvate carboxykinase (PCK1), mitochondrial phosphoenolpyruvate carboxykinase (PCK2), and pyruvate carboxylase (PC)—the key enzymes required to stimulate gluconeogenesis from propionate in ruminants (Zhang *et al.*, 2016).

In the present study, ketosis cases decreased by 50%, falling from two to one. These results align with findings by Martins *et al.*, 2019 confirmed that 200 g/day of calcium propionate provided a superior energy supply for dairy cows during early lactation. This supplementation can also increase milk yield and the contents of protein, lactose, fat, and total solids, despite a reduction in dry matter intake. Liu *et al.*, 2010 observed that increased calcium propionate supplementation improved energy status, evidenced by elevated blood glucose, decreased blood BHBA and NEFA, and reduced urine ketones.

In conclusion, the present field study showed that with the right source of calcium i.e. FinaBan 102 (Pure Calcium Propionate) can effectively reduce the chances of development of metabolic disorders such as Milk fever and ketosis. Also, as the calcium helps to maintain the muscle tone, the cases of Retention of Placenta also dropped down significantly.

Author Contributions

Parth Avinash Sutar: Investigation, formal analysis, writing—original draft. Akshay Jagdish Wankhade: Validation, methodology, writing—reviewing. Shriniwas Sawant:—Formal analysis, writing—review and editing. Parag Ghogale: Investigation, writing—reviewing.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent to Publish Not applicable.

Conflict of Interest The authors declare no competing interests.

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