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Saravanan M

SMS - Animal Science,
ICAR-Krishi Vigyan Kendra,
Pulutheri Village, R.T. Malai
(PO), Kulithalai (TK), Karur
District, Tamil Nadu, India

Vigneshwaran B

Assistant Professor, Department
of Veterinary Gynaecology and
Obstetrics, Veterinary College
and Research Institute (VC&RI),
Thalaivasal, Salem, Tamil Nadu,
India

Diraviam J

Senior Scientist and Head,
ICAR-Krishi Vigyan Kendra,
Pulutheri Village, R.T. Malai
(PO), Kulithalai (TK),
Karur District, Tamil Nadu,
India

Corresponding Author:

Saravanan M

SMS - Animal Science,
ICAR-Krishi Vigyan Kendra,
Pulutheri Village, R.T. Malai
(PO), Kulithalai (TK), Karur
District, Tamil Nadu, India

Efficacy of a Novel Phyto-Supplement (OmeB) in Enhancing Milk Yield and Fat Content in Crossbred Cows: A Field-Based Study

Saravanan M, Vigneshwaran B and Diraviam J

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Abstract

This study evaluated the efficacy of a novel phyto-supplement, 'OmeB', in modulating milk yield and composition in lactating crossbred cows. Based on a field survey identifying low milk fat as a major issue (affecting 41% of animals), twelve cows were allocated into treatment (OmeB at 100 g/day) and control groups in a 60-day feeding trial. Milk yield, fat, and solid-not-fat (SNF) percentages were analyzed fortnightly. Statistical analysis revealed a significant Time $\times$ Group interaction for milk yield and fat percentage ($p < 0.001$). The OmeB group showed a progressive increase; achieving a 16.5% higher milk yield (8.53 vs. 7.32 L/day) and a 32.4% higher fat content (4.37% vs. 3.30%) by Day 60 compared to the control. No significant effect was observed on SNF ($p > 0.05$). The results demonstrate that OmeB supplementation effectively enhances both milk production and fat content, offering a viable nutritional strategy to improve the economic value and nutritional quality of milk.

Keywords: OmeB, Phyto-Supplement, Fat, Milk Yield, Nutritional

Introduction

Dairy production plays a vital role in the Indian livestock sector and national economy, with an increase in domestic product (Azage *et al.*, 2013) ^[1]. This sector is basis of livelihoods for a vast and widely held proportion of the rural population in relation to consumption, income generation and employment. Milk and milk products are an important source of food and contributors to dietary energy requirements, protein, minerals, and vitamins of high quality particularly in vegetarian diets for human (Gorska *et al.*, 2019) ^[3]. Milk and milk products are an integral component of the human diet. Based on the results from field survey, we have identified that the low-milk-fat content in the milk was a major issue. About 41 % of the lactating animals had lower milk fat content. Omega-3 and omega-6 fatty acids are linked to beneficial health outcomes. Omega fatty acids play a crucial role in brain function, growth and development. Cows cannot produce omega-3 fatty acids and mostly obtain from their diet. Cow milk is high in saturated fatty acids because microbes degrade the feed in the rumen and convert the unsaturated fatty acids into saturated during the process bio hydrogenation. Milk is also a good source of conjugated linoleic acid (CLA), which is known to have cancer fighting and anti-atherogenic properties. Hence, the redesigning of the milk fat towards greater human health benefits is desirable for value added milk that will be beneficial to consumers as well as fetch higher price for the farmer (NIANP Annual report 2023).

Nutrition has also a major effect on both milk yield milk composition. According to O'Connor (1994) ^[12], under feeding reduces the amount milk production, the fat, protein and SNF, contents of milk. As a general rule it is believed in that any ration of diet that increases milk production, usually reduces the fat percentage of milk and fat content is influenced more by roughages (fiber) intake and SNF content can fall if the cow fed a low energy diet, but it is not greatly influenced by protein deficiency, unless the deficiency is acute. Of all milk components, milk fat is the most influenced by dietary manipulations. Most of changes in milk composition due to dietary manipulation are related to changes in ruminal acetate: propionate

ratio Kayo Garamu (2019) [2]. Several nutrition factors can influence milk composition. These includes plan of nutrition, forage concentrate ratio, forage quality (e.g., particle size), level and type of dietary fat. In plan of nutrition, under feeding dairy cows reduces lactose percentage and increases fat percentage. Feeding imbalance rations (e.g., low energy: protein ratio) may reduce milk fat and protein percentages. In case of forage concentrate, as the proportion of the concentrate in the ratio increases (above 50-60 % of ration), milk fat % tends decline. Feeding of the phyto-supplement OmeB leads to significant changes in the milk composition with a concurrent increase in overall milk fat content, also Decreases the saturated fatty acids content almost by 8-10%. It Increases monounsaturated and polyunsaturated fatty acids, increases the concentration of palmitoleic, oleic, linoleic and arachidonic fatty acids. Improves the omega fatty acids and conjugated linoleic acids content in milk

The changes in nutritional ingredients for animals generally and for dairy cattle in particular are therefore directed at enhancing the milk productivity of an individual with increased availability and higher nutrient use efficiency of energy, protein, and other essential nutrients (Tripathi, 2014) [14]. High energy supplements such as fat and oils are added to increase the energy density of animal diets, while protein sources of better amino acid composition that are extracted at higher levels for milk synthesis are used in dairy animal diets (Multari *et al.*, 2015; Miri *et al.*, 2013) [11, 10]. Milk production efficiency values could optimize dry matter intake through feed supplements that can improve the digestion and absorption of nutrients (Rigout *et al.*, 2002) [13]. On a dry matter basis, milk production efficiency increased by 2 to 4% when the ration level of 11 to 22 grams of monensin per ton of total ration dry matter rations was used (Hutjens, 2005) [6]. Lactating cows, for example, are unable to meet their nutritional requirements, i.e., they lose weight and body condition during lactation due to high nutrient demand for milk production. If fed well, 20-25% more milk could be produced from the same livestock (Herrero *et al.*, 2016) [5]. The present study was undertaken to know the efficacy of

OmeB phytosupplement in modulating milk fat per cent in lactating crossbred cows.

Materials and Methods

Healthy lactating crossbred cows (first to third lactation), weighing between 350 to 450 kg were taken for the experiment. The animals were allocated into 2 groups of 6 animals in each group based on average initial milk yield. To improve the overall fat content of cow milk and quality, the ICAR- NIANP has developed a product 'OmeB', which is formulated using phyto-sources. This supplement was formulated using phyto based agricultural waste. The product was evaluated at the commercial dairy farms in Bengaluru. The phyto-supplement can be fed to the dairy cows & buffaloes at the rate of 100 g per day in two equal dosages mixed with the concentrate ingredients. The concentrate mixture containing OmeB can be fed in the form of slurry before morning and evening milking. The experiment was conducted at Pallapalayam village, Thanthoni block, Karur district. The animals were maintained individually having regular feeding and Watering facilities. The animals were fed twice daily at around 6 AM and 3 PM. All the animals were fed standard seasonally available roughages and Concentrates mixture throughout the study period of 90 days to meet nutrient requirement (NRC 2001) calculated on individual cow basis and fortnightly milk yields and milk fat per cent. Composition (%) of the concentrate mixture was maize grain (32), groundnut cake (21), mustard cake (13), wheat bran (20), de oiled rice bran (11), mineral mixture (2) and common salt (1). The experiment was conducted for 90 days divided into pre-treatment period (15 days), treatment period (60 days) and post treatment observation period (15 days). The cows in group Control were not given any herbal preparation and acted as control.

The animals were hand milked (twice/day) and milk yield of each cow was recorded daily. Pooled milk samples (equal proportion of 2 milking) were used for determining the milk composition. Milk composition was analysed on 15th, 30th, 45th and 60th day for milk yield, fat and SNF.

Results and Discussion

Table 1: Effect of OmeB phyto-supplementation on milk yield and composition in lactating crossbred cows (Mean $\pm$ SEM).

Parameter	Group	Day 0	Day 15	Day 30	Day 45	Day 60	p-value
Milk yield (L/day)	Treatment	7.13 $\pm$ 0.05	7.55 $\pm$ 0.04	7.75 $\pm$ 0.07 ^a	8.17 $\pm$ 0.05 ^b	8.53 $\pm$ 0.10 ^c	< 0.001
	Control	7.00 $\pm$ 0.03	7.08 $\pm$ 0.02	7.15 $\pm$ 0.02	7.22 $\pm$ 0.02	7.32 $\pm$ 0.02	
Fat %	Treatment	3.22 $\pm$ 0.05	3.43 $\pm$ 0.02	3.63 $\pm$ 0.04 ^a	3.92 $\pm$ 0.04 ^b	4.37 $\pm$ 0.04 ^c	< 0.001
	Control	3.08 $\pm$ 0.04	3.10 $\pm$ 0.03	3.18 $\pm$ 0.03	3.24 $\pm$ 0.02	3.30 $\pm$ 0.03	
SNF %	Treatment	7.05 $\pm$ 0.04	7.40 $\pm$ 0.03	7.60 $\pm$ 0.03	7.73 $\pm$ 0.05	7.90 $\pm$ 0.03	0.089 (ns)
	Control	7.10 $\pm$ 0.03	7.20 $\pm$ 0.02	7.20 $\pm$ 0.02	7.25 $\pm$ 0.03	7.30 $\pm$ 0.03	

Different superscript letters (a, b, c) denote significant differences from the control group on the same day (a: $p < 0.05$, b: $p < 0.01$, c: $p < 0.001$). ns: not significant ($p > 0.05$).

The impact of dietary supplementation with the phyto-supplement OmeB on milk production and composition in lactating crossbred cows is presented in Table 1. A repeated measures two-way ANOVA revealed a highly significant interaction (Day $\times$ Group) for both milk yield and fat percentage ($p < 0.001$ for both), indicating that the effect of the supplement evolved differently over time compared to the control. No significant interaction was observed for SNF percentage ($p = 0.089$).

Milk Yield

Milk yield was significantly influenced by the OmeB

supplement (Table 1). While initial yields were comparable between groups (7.13 vs. 7.00 L/day), milk production in the treatment group exhibited a progressive increase throughout the 60-day trial. By the conclusion of the study, the treatment group achieved a mean yield of 8.53 L/day, which was 16.5% higher than the control group's yield of 7.32 L/day. Post-hoc analysis confirmed that the milk yield in the OmeB-supplemented group became statistically significantly higher than the control from Day 45 onwards ($p < 0.01$). Gupta *et al.*, (2025) [4] reported that increase in 1.1L/cow/day after feeding herbal preparation when compared to control group

Milk Fat Percentage

A pronounced effect of OmeB supplementation was observed on milk fat content (Table 1). Both groups demonstrated a normal lactation-related increase in fat percentage; however, the rate of increase was substantially greater in the treatment group. The fat percentage in the OmeB group became significantly higher than in the control group from Day 30 and remained elevated through Day 60 ($p < 0.01$). At the end of the experimental period, the mean fat percentage was 4.37% in the treatment group compared to 3.30% in the control, representing a 32.4% relative increase. Similarly Ibrahim *et al.*, (2021) [7] reported that protected fats increase fibre digestion and dry matter intake and improve milk production and milk fat content of dairy cows.

Solid-Not-Fat (SNF) Percentage

In contrast to yield and fat, the SNF percentage was not significantly altered by the dietary supplement (Table 1). Although numerical increases were noted in the treatment group at various intervals, statistical analysis showed only a main effect of time ($p < 0.05$), with no significant interaction between time and treatment group ($p > 0.05$). This indicates that changes in SNF percentage over the lactation period were similar in both groups.

The present study demonstrates that dietary supplementation with the phyto-based product OmeB significantly enhances both milk yield and fat percentage in lactating crossbred cows, while SNF percentage remained unaffected. These findings underscore the potential of targeted nutritional interventions to modulate key economic traits in dairy production. The significant and progressive increase in milk yield observed in the OmeB group aligns with the established principle that meeting and optimizing the nutrient requirements of lactating animals is crucial for unlocking production potential (Herrero *et al.*, 2016) [5]. The 16.5% higher yield in the treatment group by Day 60 suggests that OmeB improved nutrient use efficiency, possibly by enhancing ruminal fermentation or nutrient absorption, as postulated for other feed supplements aimed at optimizing dry matter intake (Rigout *et al.*, 2002) [13]. This positive effect on yield corroborates the objective of using high-energy and quality protein supplements to support milk synthesis (Multari *et al.*, 2015; Miri *et al.*, 2013) [11, 10]. The most striking outcome of this trial was the substantial elevation in milk fat percentage. Dietary manipulation is known to be the most effective means of altering milk composition, with fat being the most responsive component (Garamu, 2019) [2]. The 32.4% increase in fat content in the OmeB group is noteworthy. While a common nutritional axiom states that rations increasing milk yield often reduce fat percentage, the concurrent rise in both parameters observed here indicates that OmeB likely influenced ruminal metabolism beyond a simple energy supply. The phyto compounds in OmeB may have modulated the rumen environment, potentially favouring acetate production—a primary precursor for *de novo* fatty acid synthesis in the mammary gland—or partially inhibiting the ruminal bio hydrogenation process (NIANP Annual report, 2023). This latter mechanism is particularly relevant as it can lead to an increased outflow of beneficial unsaturated fatty acids, such as conjugated linoleic acid (CLA) and omega-3 fatty acids, aligning with the product's design goal of improving milk fat quality for human health (NIANP Annual report, 2023).

In contrast, the absence of a significant effect on SNF percentage is consistent with the understanding that SNF,

particularly protein and lactose, is less responsive to moderate dietary changes than fat, unless under severe protein or energy deficiency (O'Connor, 1994) [12]. The observed temporal increase in SNF in both groups likely reflects normal lactational changes.

In conclusion, supplementation with the OmeB phyto-supplement at 100 g/day effectively enhanced milk production and significantly improved milk fat content in crossbred cows over a 60-day period. These results validate its efficacy as a nutritional strategy to address the issue of low milk fat, potentially increasing the economic value of milk for producers and improving its nutritional profile for consumers. Further research to elucidate the precise mechanisms of action, including analysis of specific fatty acid profiles and rumen parameters, is warranted.

Conclusion

The dietary supplement had a statistically significant and positive impact on both milk yield and fat percentage in the treatment group, with effects becoming pronounced from the mid to late lactation period (Days 30-60). The supplement did not produce a statistically significant effect on the SNF percentage. These results suggest the supplement is effective in enhancing the quantity and fat content of milk, which are key economic parameters in dairy production.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Azage T, Gebremedhin B, Hoekstra D, *et al.* Smallholder dairy production and marketing systems in Ethiopia: IPMS experiences and opportunities for market-oriented development. Working Paper. 2013;31:4.
2. Garamu K. Significance of feed supplementation on milk yield and milk composition of dairy cow. Dairy and Vet Sci J. 2019;13(2):555-860.
3. Górska-Warsewicz H, Rejman K, Laskowski W, Czacotko M. Milk and dairy products and their nutritional contribution to the average Polish diet. Nutrients. 2019;11(8):1771.
4. Gupta K, Marskole S, Irapache D, Yadav S, Choudhary S. Evaluation of a novel herbal formulation for improving milk fat and yield in Indian Gir dairy cattle: A seasonal controlled trial. Journal of Ayurveda and Holistic Medicine (JAHM). 2025;13(7):2-14.
5. Herrero M, Henderson B, Havlík P, Thornton PK, Conant RT, Smith P, Wiersenius S, Hristov AN, Gerber M, Butterbach-Bahl K. Greenhouse gas mitigation potentials in the livestock sector. Nature Climate Change. 2016;6(5):452-461.
6. Hutjens MF. Dairy efficiency and dry matter intake. In: Proc. 7th Western Dairy Management Conference; 2005; Reno, NV. p. 71-76.
7. Ibrahim NA, Alimon AR, Yaakub H, *et al.* Effects of vegetable oil supplementation on rumen fermentation and microbial population in ruminant: A review. Tropical Animal Health and Production. 2021;53(4):422-434.
8. ICAR - National Institute of Animal Nutrition and Physiology. NIANP Annual report. 2023. Available from: <http://www.nianp.res.in>

9. Garamu K. Significance of feed supplementation on milk yield and milk composition of dairy cow. Dairy and Vet Sci J. 2019;13(2):555-860.
10. Miri VH, Tyagi AK, Ebrahimi SH, Mohini M. Plants extract enhanced ruminal CLA concentration, in vitro. Journal of Animal and Feed Sciences. 2013;22(3):219-228.
11. Multari S, Stewart D, Russell WR. Potential of fava bean as future protein supply to partially replace meat intake in the human diet. Comprehensive Reviews in Food Science and Food Safety. 2015;14(5):511-522.
12. O'Connor DL. Folate in goat milk products with reference to other vitamins and minerals: A review. Small Ruminant Research. 1994;14(2):143-149.
13. Rigout S, Lemosquet S, Bach A, Blum JW, Rulquin H. Duodenal infusion of glucose decreases milk fat production in grass silage-fed dairy cows. J Dairy Sci. 2002;85:2541-2550.
14. Tripathi MK. Effect of nutrition on production, composition, fatty acids and nutraceutical properties of milk. Advances in Dairy Research. 2014;2014:1-11.

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