**Efficacy study of HimCal supplementation on milk yield in lactating dairy cows**

Ravikumar B.R., Veterinary Hospital, Mahalaxmipuram, Bangalore  
Mohan D., Veterinary Hospital, Doddagattiganabbe, Hoskote Taluk, Bangalore  
Bhagwat V.G* and Mitra S. K.  The Himalaya Drug Company, Makali, Bangalore.

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**INTRODUCTION**

Proper mineral nutrition and supplementation is essential to animal health and high level of milk production (Harris et al 1994). Most of the diet of ruminants is plant material and the amount of minerals present in the plants depends on the mineral status of the soil on which the herbage grows, the ability of the plant to absorb them, and the stage of growth of the plant. The levels of minerals can even vary from field to field on the same farm (Chesworth and Guérin 1992; Preston and Leng 1987). Therefore, it is very difficult to give average values for the amount of minerals that might be expected from feeds. Grains are low in calcium content but high in phosphorus. Legumes usually are good sources of calcium but not phosphorus, and grasses are much lower in calcium than legumes (Schroeder 2004). Cows that produce more milk require more calcium due to the greater obligatory loss of calcium in the larger volume of milk. Cows that are ill but are still lactating should receive supplementary calcium in addition to other treatments for the primary disease.

The objective of present study is to assess the efficacy of supplementing HimCal on milk yield of lactating dairy cows. HimCal is a polynutrient formulation manufactured and marketed by The Himalaya Drug Company, Bangalore, India to improve milk yield in dairy cows. HimCal contains Mouktika sukti (comprises calcium, phosphorus and Vitamin D₃) Jivanti (*Leptadenia reticulata*) and Shatavari (*Asparagus racemosus*).

*Corresponding author
MATERIALS AND METHODS

Present feeding trial was conducted on 28 cows (17 cross bred Holstein Friesian and 11 cross bred Jersey cows) of different age belonging to farmers in and around Bangalore. Animals were individually penned, and fed with native grass hay and concentrates. *Ad libitum* fresh and clean water was provided throughout the trial period. Based on milk yield, the cows were divided into three groups, viz, low yield (0-6 liters), medium yield (6-12 liters), and high yield (more than 12 liters). Individual cows were supplemented (drenched/ mixed with feed) with HimCal 100ml daily for 10 days. Animals were hand milked twice daily at 6 to 7 AM and 5 to 6 PM and daily milk yield was recorded accordingly. Milk yield was recorded, 7 days before HimCal supplementation 7 days, during supplementation (10 days) and 7 days after supplementation. Control group was not maintained because of self-control. Data for feed intake and refusals were recorded on daily basis. Any sign of estrus manifestation was visually observed and recorded. Animals in heat were inseminated with artificial insemination (AI) after 7 to 8 hours of observed estrus. Statistical analysis of the data was carried out using “One-Way ANOVA” followed by “Dunnett's Multiple Comparison Test” using GraphPad Prism version software, San Diego California USA.

RESULTS AND DISCUSSIONS

HimCal supplementation improved milk yield in dairy cows (Table).

**Low milk yield group:** There was a significant (*p*<0.01) improvement in milk yield during and after supplementation period as compared to pre-supplementation (Figure 1) in low milk yield group. HimCal improved milk yield during supplementation period to the extent of 14.94% as compared to pre-supplementation period.

**Medium milk yield group:** There was a significant (*p*<0.01) improvement in milk yield during and after supplementation period as compared to pre-supplementation (Figure 2). HimCal improved milk yield during supplementation period to the extent of 8.06% as compared to pre-supplementation period.

**High milk yield group:** There was a significant (*p*<0.01) improvement in milk yield during and after supplementation period as compared to pre-supplementation (Figure 3). HimCal improved milk yield during supplementation period to the extent of 5.66% as compared to pre-supplementation period.
Improved milk yield trend continued even after withdrawal of HimCal supplementation in all three groups. The ingredients of HimCal possess galactopoietic action. The study shows that HimCal supplementation improves the production performance of cows.

**Mouktika sukti:** The main component of Mouktika sukti is calcium, present as calcium carbonate. Also magnesium, oxide of iron, alumina, and silica are present. These minerals are required for the toning up of muscles. Bhasma is reported to have aphrodisiac property (Kulkarni et al., 2002; Chauhan et al., 1998). Efficiency of feed utilization (DM intake) tended to increase when calcium carbonate was supplemented to the diet; however, this increase was not significant. (Clark et al., 1989).

**Leptadenia reticulata:** Lactogenic effect of stigma sterol and ether fraction isolated from *Leptadenia reticulata* were studied on lactating rats. On consideration of results on parameters of pup weight, body weights of mother rats, photomicrographic studies of lactating mammary glands on the 23rd day, secretory rating, parenchyma percentage, glycogen contents and protein contents of mammary glands, it was observed that both the principles had lactogenic effect on lactating rats (Anjaria et al., 1975). Crude *Leptadenia reticulata* administered to five cows in the dose of 1.5gm/cow/b.i.d for 15 days produced an increase in milk yield in four out of five cows with a net gain of 10.5% (Anjaria, 1980). Clinical study of Leptaden tablets (2 tablets 3 times a day) on 50 puerperal mothers showed a marked improvement in the flow of milk and fat content when compared to the control group mothers (Kasturi et al., 1980).

**Asparagus racemosus:** Five hundred grams of fresh roots of *Asparagus racemosus* per day, from 21st day after calving till 50 days was fed to lactating buffalos, which resulted in a significant increase in milk yield (Patil and Kanitkar, 1969). Lohar et al. (1991) demonstrated that *Asparagus racemosus* roots is a rich source of minerals and trace elements such as calcium, copper, magnesium, iron, manganese, nickel, and zinc. Presence of calcium in the powder correlates with the analytical results for galactogogues. The effects of the crude alcoholic extract of *Asparagus racemosus* 250mg/kg, intramuscularly were studied in post-partum, estrogen-primed and non-primed rats. The extract increased the weight of mammary glands in post-partum and estrogen-primed rats and uterine weight in estrogen-primed group. Increase in the weights of adrenals coupled with depletion of ascorbic acid suggests the release of pituitary adrenocorticotropic hormone. The growth of the lobulo-alveolar tissue and milk secretion in the estrogen-primed rats may be due to the action of released corticoids or prolactin (Sabnis et al., 1968).
The beneficial effect of HimCal is due to the synergistic action of various ingredients in the formulation.

CONCLUSION
HimCal improved milk yield in dairy cows. There is no adverse effect of HimCal on health of cows during the feeding trial. Hence, HimCal can be used safely to improve milk yield in lactating dairy cows.

ACKNOWLEDGEMENT
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REFERENCES


<table>
<thead>
<tr>
<th>Milk yield (in ltrs.)</th>
<th>Before Supplementation</th>
<th>During Supplementation</th>
<th>After Supplementation</th>
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<tbody>
<tr>
<td>Low</td>
<td>4.75 ± 0.00</td>
<td>5.46 *± 0.08</td>
<td>5.52 *± 0.03</td>
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<tr>
<td>Medium</td>
<td>9.42 ± 0.02</td>
<td>10.18 *± 0.12</td>
<td>10.68 *± 0.03</td>
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<tr>
<td>High</td>
<td>14.84 ± 0.04</td>
<td>15.68 *± 0.16</td>
<td>16.43 *± 0.03</td>
</tr>
</tbody>
</table>

*Differs significantly (*p*<0.01) from before HimCal supplementation.
Figure 1: Efficacy of HimCal in low yield dairy cows (N-10)

*Differs significantly (p<0.01) from before HimCal supplementation
Figure 2: Efficacy of HimCal in medium yield dairy cows (N=10)

*Maintains significantly (p<0.01) from before HimCal supplementation*
Figure 3: Efficacy of HimCal in high yield dairy cows (N=10)

*Differs significantly (p<0.01) from before HimCal supplementation*