Study to Assess the Efficacy and Safety of Galactin Vet Bolus* in Lactating Dairy Cows

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Abstract
The investigation was carried out on 14 Lactating cows in the declining stage of milk production. Galactin Vet Bolus was administered to the animals at 5 boli daily for 10 days. Galactin Vet Bolus improved milk yield, fat percent and SNF percent in dairy cows. No untoward effect were observed biochemically and hematologically through out the study period. Hence, Galactin Vet Bolus can be used safely as galactogogue in dairy animals.

The goal of most dairy producers is to maximize milk production. Under normal situations, milk production increases during the first six weeks of lactation and then gradually decreases. Even in stress (environmental, physical, lactation etc.) also milk production decreases. Proper feeding and management of the dairy herd can improve the economy of production and the health of a cow. Optimal milk production with maximum levels of milk fat and protein is essential for achieving the economic benefits. It has been a common practice adopted by farmers to feed their animals with different galactagogues. Many medications, foods and herbal therapies have been recommended as galactagogues. The medications used often exert their effects through antagonism of dopamine receptors, resulting in increased prolactin (Gabay, 2004). The purpose of the trial reported herein was to study the effect of feeding Galactin vet bolus (of The Himalaya Drug Company, Bangalore) which contains powders of Leptadenia reticulata, Asparagus racemosus, Withania somnifera, Arundo donax, Cissampelos pareira, Foeniculum vulgare, and extracts of Eclipta alba and Solanum nigrum on the quality and quantity of milk produced by lactating dairy cows. The study also assessed the safety profile of the product.
MATERIALS AND METHODS

The present study was conducted on 14 lactating cows in the declining stage of milk production, belonging to different lactation breeds and age. Galactin vet bolus was administered to 14 animals at 5 boli daily for 10 days. All the animals used in the study were housed, fed and managed under identical managemental practices. Daily morning and evening milk yield was recorded before treatment (7 days), during treatment (10 days) and after treatment (15 days), for all the cows. Corrected lactometer reading (CLR), fat% and Solid Not-Fat (SNF) % were recorded once before treatment, twice during treatment and after treatment. Biochemical and hematological analysis of blood was done before initiation of the trial and on the 14th day of the treatment.

Statistical analysis of the data was carried out using “One-Way ANOVA” followed by “Bonferroni’s Multiple Comparison Test” or “Unpaired Student ‘t’ Test” was performed using GraphPad Prism version 4.00 for Windows, GraphPad Software, San Diego California USA, www.graphpad.com”.

RESULTS AND DISCUSSIONS

Milk production (liters): The results indicated that the total milk yield (liters) of all the animals prior to treatment was 140.24 (mean 10.02), during treatment 148.75 (mean 10.62) and after treatment 147.93(mean 10.57). There was an improvement of 6.06 % in milk yield during the treatment (average 0.60) and following the treatment 5.48% in milk yield (average 0.55) was observed. Overall improvement in milk yield after the treatment was 0.57 liters (average) when compared to milk yield prior to the treatment. Improved trend in milk yield was observed from the 2nd day onwards till day 10 and later on started declining (Table 1 and Figure 1). Milk yield during and after treatment differs significantly (p<0.001) as compared to before treatment. Milk yield during treatment did not differ significantly as compared to after treatment.

CLR: Corrected lactometer reading before treatment (26.79), during the treatment (28.96) and after treatment (29.25) indicates the role of Galactin Vet Bolus in non-significant improvement of the CLR. Over all, 8.64% improvements in CLR were recorded (Figure 2).
CLR not differs significantly between treatments. However, the differences in CLR between treatments were not statistically significant.

**Milk fat (%):** The average fat percent prior to treatment, during the treatment and following treatment was 4.66, 4.83 and 4.8 respectively. Over all improvement in milk fat% during and following the treatment was 3.64 and 3.00 in cows respectively (Figure 3). There was no significant difference in mil fat (%) between treatments.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Before treatment</th>
<th>During treatment</th>
<th>After treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk yield (Liters)</td>
<td>10.02</td>
<td>10.62&lt;sup&gt;a&lt;/sup&gt;</td>
<td>10.57&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Milk fat (%)</td>
<td>4.66</td>
<td>4.83</td>
<td>4.80</td>
</tr>
<tr>
<td>Milk SNF (%)</td>
<td>12.89</td>
<td>13.29</td>
<td>13.4</td>
</tr>
<tr>
<td>CLR reading</td>
<td>26.79</td>
<td>28.96</td>
<td>29.25</td>
</tr>
</tbody>
</table>

<sup>a</sup>p<0.001 as compared to before treatment; <sup>b</sup>Non-significant as compared to during treatment.

**SNF (%):** The average SNF (%) recorded before, during and after the treatment was 12.89, 13.29 and 13.4 respectively. Over all a 3.52% improvement in SNF was recorded (Figure 4). Milk SNF (%) during and after treatment differed significantly (p<0.01 and p<0.001 respectively) as compared to before treatment.

Total count, serum glutamic-pyruvic transaminase (SGPT), serum glutamic-oxaloacetic transaminase (SGOT), blood urea nitrogen (BUN), creatinine, calcium, phosphorous and total protein before and after treatment period were well within range (Figures 5-13). There was improvement in the hemoglobin levels of treated cows, which indicates the good health of the animals (Figure 6). Hemoglobin, serum calcium and total protein levels after treatment increased significantly (p<0.05) as compared to before treatment.

The study shows that there is gain in milk yield from feeding Galactin Vet Bolus to cows. This is a very significant finding as during summer, due to adverse climatic conditions, the milk yield is usually reduced. In the study, supplementing Galactin Vet Bolus kept up the level and further improved milk production. Oxidative stress role in lactation, usually during summer months the milk yield drops due to heat stress but with cows on Galactin Vet Bolus supplementation, this drop was not observed. The health of the animals remained good during...
the trial. The improvements in butter fat%, SNF%, Hb%, Ca and Total protein were also very impressive. SGPT, SGOT, creatinine and BUN values of treatment group were comparable that of control group, which clearly indicates the safety of Galactin Vet Bolus.

The beneficial effect of Galactin Vet Bolus is due to the synergistic action of various herbs in the formulation.

**Leptadenia reticulata**: Lactogenic effect of stigmaasterol 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 @ 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).

**Asparagus racemosus**: 500 gms of fresh roots of *Asparagus racemosus* per day, from 21 day after calving till 50 days was fed to lactating buffaloes and showed significant increase in milk yield (Patil and Kanitkar, 1969). Lohar et. al. (1991) reported the analytical results of 5 gms of *Asparagus racemosus* roots as containing of 0.172 mg of calcium, 0.033 mg of copper, 0.204 mg of iron, 0.169 mg of magnesium, 0.0074 mg manganese, 0.105 mg of nickel and 0.072 mg of zinc. Presence of calcium in the powder correlates with the analytical results for galactogogues.

The effects of the crude alcoholic extract of *Asparagus racemosus* (250 mg/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 the estrogen-primed group. Increase in the weights of adrenals coupled with depletion of ascorbic acid suggests the release of pituitary adrenocorticotropic hormone (ACTH). 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., 1967).

**Withania somnifera**: Antistressor properties of *Withania somnifera* (100mg/kg b. wt) in adult Wistar albino rats and cold water swimming stress test indicate that the treated animals show better stress tolerance (Archana and Namasivayam, 1999).

**Arundo donax**: It contains bufotenidin and eleagne and is used as a stimulant for menstrual discharge and diminished milk secretion (ICMR 1976).

**Cissampelos pareira**: *Cissampelos pareira* has potent antioxidant activities. In studies, it was found to significantly reduced the lipid peroxidation and inhibited the decrease
in antioxidant enzyme levels (superoxide dismutase and catalase) in mice (Amresh, et al., 2004).

**Foeniculum vulgare:** Oral administration (200 mg/kg) of *Foeniculum vulgare* fruit methanolic extract exhibited inhibitory effects against acute and subacute inflammatory diseases and type IV allergic reactions and showed a central analgesic effect. Moreover, it significantly increased the plasma superoxide dismutase (SOD) and catalase activities and high density lipoprotein-cholesterol level (Choi, 2004).

**Eclipta alba:** The hepatoprotective effect of the ethanol/water (1:1) extract of *Eclipta alba* has been studied at subcellular levels in rats against CCl₄-induced hepatotoxicity. *Eclipta alba* significantly counteracted CCl₄-induced inhibition of the hepatic microsomal drug metabolizing enzyme. The loss of hepatic lysosomal acid phosphatase and alkaline phosphatase by CCl₄ was significantly restored by *Eclipta alba*. The study shows that hepatoprotective activity of *Eclipta alba* is by regulating the levels of hepatic microsomal drug metabolizing enzymes (Saxena, 1993).

**Solanum nigrum:** The presence of plant extracts of *Solanum nigrum* in the reaction mixture containing calf thymus DNA and free radical generating system protect DNA against oxidative damage to its deoxyribose sugar moiety. These study results suggest that the observed hepatoprotective effect of these crude plant extracts may be due to their ability to suppress the oxidative degradation of DNA in the tissue debris (Sultana et al., 1995).

The above observations are in agreement with the findings of Ramesh et al., (2000) and Rajeshwari (2000).

REFERENCES


*Brief Information...*


Figure 1: Efficacy of Galactin Vet Bolus on lactation in dairy cows (N=14)

Figure 2: Effect of Galactin Vet Bolus on CLR
Figure 3: Effect of Galactin Vet Bolus on milk fat (%) of dairy cows

Figure 4: Effect of Galactin Vet Bolus on milk SNF (%)
Figure 5: Effect of Galactin Vet Bolus on hemoglobin

Figure 6: Effect of Galactin Vet Bolus on total count
Figure 7: Effect of Galactin Vet Bolus on SGOT level

Figure 8: Effect of Galactin Vet Bolus on SGPT level
Figure 9: Effect of Galactin Vet Bolus on BUN

Figure 10: Effect of Galactin Vet Bolus on Creatinine level
Figure 11: Effect of Galactin Vet Bolus on Calcium levels

Figure 12: Effect of Galactin Vet Bolus on Phosphorus level
Figure 13: Effect of Galactin vet bolus on TP

*\(p<0.05\) as compared to before treatment