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# Efficacy of anthelmintics against gastrointestinal nematodes in crossbred dairy cattle

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**Abstract**
The present study on- farm trial (OFT) was carried out at Basupatti villages of Muzaffarpur district of Bihar to assess the comparative efficacy of albendazole, fenbendazole and ivermectin against gastrointestinal nematodes in naturally infected crossbred cattle and their correlation with milk production. Forty (40) milking crossbred cattle naturally infected with gastrointestinal nematodes were selected based on faecal examination and randomly divided into four equal groups, each having ten animals. They were designated as F1, F2, F3 and F4. Animals of group one, F1 were kept as untreated control whereas animals of group F2, F3, and F4 were treated with albendazole, fenbendazole and ivermectin at the dose rate of 7.5, 5.0 and 0.2 mg/kg body weight, respectively. The efficacy of each anthelmintic was assessed on the basis of reduction in egg per gram (EPG) in faeces as well as their positive response in the term of increase in milk yield among the animals of treatment groups. It was observed that there were sharp reductions in EPG in the animals of all three treatment groups which came to zero at 14$^{th}$ day and were the same at 28$^{th}$ day as well whereas a gradual increase in EPG was noticed in animals of untreated control group (F1). The reduction in EPG was reflected in terms of increase in milk yield in the animals of the all three treatment groups ranging from 10-13% in 30 days post treatment whereas there was marginal rise is noticed in untreated group as well

**Keywords:** Anthelmintic Albendazole, Fenbendazole and Ivermectin

## Introduction
India‘s livestock sector is one of the largest in the world. Among livestock, dairy farming plays a pivotal role in the development and progress of small and marginal farmers of rural India. Gastrointestinal parasitic infections are major health problem in domestic ruminants throughout the world which is considered as the main hurdle in growth of dairy industry. The north region of Bihar is famous for its dairy cattle and buffaloes. The economy of rural people largely depends on cattle’s wealth. There are several constraints for low productivity and infertility of our dairy animals out of which gastrointestinal parasitic infections are one of the important factors. The prevalence of gastrointestinal parasitic infection is high in pasturing adult cows. This infection are many a times subclinical in nature in most adult cattle population and is responsible for the decreased production in terms of milk yield which further responsible for the economic losses in dairy cows (Charlier *et al*., 2009) [3].A major distinctive feature of this gastrointestinal parasitism is the loss of protein into the gut and increased rates of gastrointestinal tissue protein metabolism and a net movement of amino acid nitrogen from muscles and skin to liver and gastrointestinal tract which decreases their availability for growth, milk and meat production (Holmes, 1985) [6].

Morbidity and mortality have been observed in parasitic infected cows and buffaloes. Some external symptoms exhibited by the suffering ruminants include reduction in body weight gain, reduction in utilization of nutrients so the decreased production in terms of milk and meat yield. The gastrointestinal infection in domestic ruminants occurs mainly due to lack of scientific care and management, grazing of animals on low land area or infected pasture etc. It has been observed (Anon, 1990) [1] that about one-third of total animals losses due to parasitic infection. Chatterjee and Acharya (1987) [5] reported that by implementation of effective preventive and control measures for parasitic infection, milk production of dairy animals could be increased by 10-20 percent. Several studies have indicated that a beneficial response by treatment of gastrointestinal parasitic infection in dairy animals (Charlier *et al*., 2010, and Mason *et al*., 2012) [10, 7].

The present investigation was undertaken to assess the comparative efficacy of the three commonly used anthelmintics, albendazole, fenbendazole and ivermectin against gastrointestinal nematodes in naturally infected crossbred cattle and their correlation with milk production.

## Materials and Methods

The present trial for assessing the efficacy of anthelmintic was carried out at Basupatti village of Muzaffarpur district of Bihar. Forty lactating crossbred cattle naturally infected with gastrointestinal nematodes were used for this trial. Selection of animals was made on the basis their stage of lactation and EPG in their faeces. The animals having EPG ranging between 400 to1000 were selected for the trial. During routine health checkup animals having history of passing semisolid to diarrheic faeces were screened for parasitic infections and EPG was calculated for positive cases. The animals having EPG ranging between 400 to1000 and were in their second to third lactation were selected for the trial. Selected animals were randomly grouped into four equal groups each having 10 animals and designated as F1, F2, F3, and F4. Animals of group F1 were kept as untreated control whereas the animals of group F2, F3 and F4 were treated with albendazole, fenbendazole and ivermectin at the dose rate of 7.5, 5.0 and 0.2 mg/ kg body weight orally, respectively. The fresh faecal samples were collected individually on 0 day pre treatment and on 14and 28$^{th}$ day post-treatment from all animals of treatment as well as control group to assess the parasitic lead before and after the treatment. EPG of faeceal samples was carried out by modified Mac-Master technique. The milk yield of each animal was recorded from 03 days before to 30 days after the start of anthelmintic treatment to observe their response on milk production. All the animals were maintained on the routine feeding standard throughout the course of the study.

The efficacy of the anthelmintic was assessed on the basis of reduction in parasitic load in terms of reduced eggs per gram (EPG) of faeces in animals of treated groups, gradual disappearance of clinical signs as well as improvement in mild yield.

## Results and Discussion

The positive response of the treatment in the present study reflected first in terms of regaining the normal faecal consistency from semisolid and diarrhoeic followed by gradual coming back of animals to their normal production. The data pertaining results have depleted in the table no 1. The date shows that the EPG of all the animals of treatment groups (F2, F3, and F4) on the 14$^{th}$ day of post infection became zero whereas a gradual rise was observed in animals of untreated control group (F1) which became 2866 from 2551 (zero day). The similar pattern was observed on the 28$^{th}$ day post treatment also as the animals of treatment group maintained a zero EPG whereas a slight increase was observed in animals of untreated control group (F1) which became 3449 from 2866 (14$^{th}$ day). A clear cut improvement was noticed in milk production in the animals of all three treatment group as well. The date revealed that among treatment groups a maximum (12.38%) increase in milk production was observed in the animals of ivermectin treated group (F4) and a minimum (10.53%) increase in milk production was in the animals of albendazole treated group (F2) whereas an 11.75% increase in milk production was in the animals of fenbendazole treated group (F3) after 30 days post treatment. Our observations are in agreement with the findings of Charlier *et al.*, (2010) [4], Mason *et al*., (2012) [7] and Bullen *et al*., (2016) [2]. A slight (1.03%) rise in milk production was noticed in the animals of untreated group (F1) after 30 days post infection, this could due to increase in host immune response.

Therefore, our findings suggest that either of three commonly used anthelimitics, albendazole or fenbendazole or ivermectin is effective in combating the gastrointestinal nematodes of livestock and helpful in boosting up milk production as well.

**Table 1:** The data pertaining results have depleted

| Average EPG (Eggs/gm of faeces) | | | | Average Milk yield (lit/d) | | % increase in Milk yield |
|---|---|---|---|---|---|---|
| **Treatments** | **0 Days** | **14 Days** | **28 Days** | **Before treatment** | **30 Days after treatment** | **30 Days after treatment** |
| F1 | 2551 | 2866 | 3449 | 9.65 | 9.74 | 1.03 |
| F2 | 2650 | 0 | 0 | 9.36 | 10.4 | 10.53 |
| F3 | 2338 | 0 | 0 | 9.67 | 10.81 | 11.75 |
| F4 | 2782 | 0 | 0 | 9.59 | 10.79 | 12.38 |

**Note:** EPG values and Milk yield (lit/day) values are average of ten animals of respective groups

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