REPRODUCTIVE PERFORMANCE DURING PARASITIC LOADS AND ITS CONTROL IN DOES

DINESH MAHTO[1], L.B.SINGH[2], M.P.SINHA[3], D.K.SINGH "DRON"[4] AND D.K.JHA[5]

AICRP, on Black Bengal Goat, Department. of ABG, College of Veterinary Science and Animal Husbandry (BAU) Kanke, Ranchi-6 Jharkhand.(India)

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ABSTRACT

A total number of 18 does, which had kidded at least once and were found positive for common intestinal nematodes, were treated with Albendazole (Helmigard) @ 5mg/kg body weight orally along with a supportive therapy of mineral mixture (Calvimin) @ 10 gm orally daily for 20 days. Six goats were kept as untreated control. The minimum interval from treatment to onset of estrus in does was recorded in Albendazole + Mineral mixture group (43 days) which was followed by Albendazole group (46 days) and control group (52days), the average required number of services per conception in does were 1.33, 1.00 and 2.00, respectively. The pregnancy rates in the three groups were 66.66, 83.33 and 33.33%, respectively in case of does. The Albendazole along with Mineral mixture can be administered to the parasitized goats to improve their reproductive performances.

Key words: Albendazole, Mineral, Nematodes, Estrus and Does.

The goat husbandry plays a significant role in the national economy. Inadequate nutrition coupled with high level of parasitic infection contribute to high reproductive and productive wastage in small ruminants. Apart from this, intestinal helminthes cause significant reduction in efficiency of nutrient utilization (Coop and Angus, 1975), poor calcium and phosphorus retention (Sykes and Coop, 1976) and poor feed conversion (Andrew *et al.*, 1944), blood loss and loss of plasma protein (Arora *et al.*, 2001). Several parasitic infections are known to cause serious health hazards for the animals being raised under different system of management. The reproductive efficiency of goat is also directly or indirectly affected by various gastrointestinal helminthes which was assessed in the present study.

Present Address:[1] SRF (AICRP on Goat), , [2] Univ. Prof, Deptt. of AGB,
[3] Univ. Prof.(ARGO), [4]Univ. Prof. (ADR) ,
[5]SRF(AICRP on Poultry Breeding) **Email: drdineshgy@gmail.com.**

The present study was conducted to see the effect of intestinal parasites on reproductive performance of does. For this a total number of 18 does which had kidded for at least once and were found positive for common intestinal nematodes were utilized and allotted to three groups viz. T_1, T_2 and T_3, each group having 6 animals. The animals of group – T_1 were treated with Albendazole (Helmigard) @ 5mg/kg body weight, orally. The T_2 animals were treated with Albendazole @ 5mg/kg body weight orally along with a supportive therapy of mineral mixture (Calvimin) @ 10 gm orally daily for 20 days. Animals of group – T_3 served as untreated control. All the experimental does were maintained at almost balanced diet along with routine grazing at least 4 to 5 hours daily. Clean water was supplied ad–lib. The does were provided with ear tags for proper identification. The primary health check up of each animal was carried out prior to the experiment. During the course of experiment, animals were kept under close observation. Reinfected in few cases in both the treatment groups were treated with the same drugs on day 35, if found

positive.

The efficacy of Albendazole and Albendazole + Mineral mixture were used to control the common G.I. helminths in does.Albendazole alone and Albendazole + Mineral mixture during the present study revealed almost 100% efficacy against the common G.I. helminths of does (*Haemonchus, Strongyloides, Trichostrongylus, Oesophagostomum, Bunostomum, Cooperia and Ostertagia* spp.) as assessed by the day 20 post treatment EPG counts (Table). The present findings are in agreement with Singh *et al.* (1994). Repeat treatment found to be almost 100 per cent effective as assessed by the post treatment EPG observations on day 40 in the does.

The goats infected with G.I. helminthes and subsequently treated with Albendazole were found to have lower Hb (g/dl) and PCV (%) on day zero i.e. 8.78±0.02 g/dl and 26.29±0.26 per cent, which significantly improved to 10.78±0.05 g/dl and 31.90±0.13 per cent, respectively on day 20 post treatment. The G.I. helminthes infected does when treated with Albendazole + Mineral mixture, it was observed that the values of Hb and PCV also improved from 8.93±0.04 g/dl and 26.52±0.03 per cent on day zero before treatment to 10.96 ±0.08 g/dl and 32.44 ± 0.15 per cent on day 20 post treatment. Whereas, the infected untreated control does continued to have reduced haematological values of Hb and PCV during the entire period of observations. The haematological observations of the present finding are in close agreement with the findings of Lakra *et al.* (2007) in Black Bengal goat. The reduction in Hb and PCV values during infection recorded during present study might have occurred due to blood loss, less feed intake and utilization, suppressive effects on haemopoiesis caused by the toxic substances produced by helminthes in the host.

The overall mean serum calcium level in infected does prior to treatment were recorded to be 8.63±0.11 mg/dl, which increased significantly after treatment in the group of animals. Which is in accordance with the findings of Dede *et al.* (2003) in goat. The infected animals were found to have lower calcium value than the treated animals, which might occur due to the poor absorption of calcium from the gut (Roseby, 1973 and Sykes *et al.* 1977). The mean levels of serum phosphorus prior to treatment were 2.72±0.11 mg/dl, in infected untreated does. The value increased significantly after treatment in the does. The serum inorganic phosphorus level was lower in control (i.e. infected) does. This result is also in close agreement with the reports of Arora *et al.* (2001) and Rajguru *et al.* (2001). The lower level of serum inorganic phosphorus in infected animals might be due to the infection of parasite present in G.I. tract and its effects on feed intake and digestion (Roseby, 1973) and utilization.

The levels of copper in does in T_1, T_2 and T_3 group on day 0 were found to be 27.38±0.23, 27.04±0.08 and 27.76±0.13 µg/dl, respectively. The corresponding values on day 20 post treatment were 26.57±0.20 µg/dl and 82.70±0.04, 83.76±0.14 and 26.59±0.04 µg/dl, respectively. The copper level was lower in infected does as compared to post treatment values which is in close agreement with the findings of Dede *et al.* (2003) in goats and Lakra *et al.* (2007) in Black Bengal goats.

The levels of zinc in does in T_1, T_2 and T_3 group on day 0 were found to be 46.29±0.26, 46.52±0.25 and 46.72±0.23 µg/dl, respectively. The corresponding values on day 20 post treatment were 81.64±0.58, 87.09±0.59 and 44.13±0.72 µg/dl, respectively. The zinc levels were lower in parasite infested does which are in close agreement with the earlier reports of Dede *et al.* (2003) in goats and Lakra *et al.* (2007) in Black Bengal goats. The decreased biochemical profiles during present study might have occurred due to blood loss caused by sucking nature of some helminths particularly that of *Haemonchus contortus*. Some helminths also produce hypoproteinemia, hypoalbuminemia and hypoglycemia due to reduced feed intake and absorption through the injured gut and elevation of blood gastrin level, which results in altered

carbohydrate metabolism and ultimately function of liver gets disturbed.

Hypoalbuminemia has been seen as the most common cause of a low serum total calcium. Due to alteration in carbohydrate metabolism, serum phosphorus level gets decreased. Bursate worms cause macrocytic hypochromic anaemia, which results into serum deficiency as copper helps in blood cell formation. Zinc has the binding ability with protein to over 60 percent, so the resultant hypoproteinemia and hypoalbuminemia in case of parasite infestation are the main cause for decrease in the level of zinc in serum.

All the biochemical profiles are the fractions of haemoglobin. Therefore, treatment with broad spectrum anthelmintic along with supportive drugs appears to have helped the G.I. helminths affected animals to recover anaemia due to repairing of damage tissue, restoration of body fluid balance and resumption of their function. In infected animals the levels of Ca, P Cu and Zn, Hb and PCV were low which improved after treatment. Balakrishnan and Balagopal (1994) have reported that serum Ca, P, Cu and Zn levels were significantly lower in buffaloes with poor reproductive performances. Bhaskaran and Abdullah Khan (1981) have reported that marginal deficiency of Phosphorus is sufficient to cause disturbances in pituitary ovarian axis without manifestation of specific deficiency symptoms. Mufarrege *et al.* (1986) also found that blood phosphorus concentration was higher in cow which conceived than that which did not conceive. Phosphorus is also essential for transfer of biological energy particularly through ATP and its deficiency may thus interfere with fertilization and or may cause early embryonic death. All the haematological parameters improved after treatment. EPG count dropped to almost zero post treatment and the reproductive performance improvement after treatment in this study might be due to increased serum levels of Ca, P, Cu and Zn and improved level of Hb and PCV post treatment.

Interval from treatment to onset of estrus revealed that this duration was significantly shortest (43.00±0.73 days) in does in Albendazole + Mineral mixture treated ewes and does followed by Albendazole treated group of does. However, these values were significantly higher in both the treated groups as compared to the untreated control group of does (Table), Gatongi *et al.* (1997) reported that after treatment with Ivermectin @ 200 µg in does the flock fertility and reproductive performance improved as compared to untreated ewes does. The infected untreated ewes does might have exhibited the first estrus after prolonged interval due to anaemia, anorexia, poor growth and macro mineral deficiency in blood serum under the influence of intestinal parasites. The results of the present study indicated significantly lowest number of services per conception (1.17 for does) and highest pregnancy rate (83.33±4.30 for does) in the treatment group T_2 where Albendazole + Mineral mixture were administered. During the present study, the reproductive performance of does improved after treatment with anthelmintic drugs. The interval from treatment to onset of estrus was low, the numbers of services per conception were also low and the pregnancy rate percent were higher in treated animals.

Finally, it can be inferred that for achieving all around improvement in health and reproductive performance, the application of package for parasite control appears to be beneficial. Gastrointestinal helminthes parasites

TABLE: EFFICACY OF ALBENDAZOLE ALONE OR IN COMBINATION WITH MINERAL MIXTURE FOR THE CONTROL OF COMMON G.I. HELMINTHES IN DOES.

Groups (No. of animals)	Average pre treatment EPG on 0 day	Average post treatment EPG and drug efficacy (%) on 20th DPT	Average After repeat treatment EPG and drug efficacy (%) on 40th DPT	Status of parasitic infection on 75th day	Treatment Response Interval (Occurrence of estrous), days.	Conception Rate (%)
T_1 (N= 6)	1783.33±87.24	33.33±33.33[a] (98.13%)	00.00±0.00[a] (100%)	Completely cured off helminthes infection	46.00±0.73[b]	66.66±7.45[b]
T_2 (N= 6)	1750.00±67.08	16.66±16.66[a] (99.04%)	00.00±0.00[a] (100%)	Completely cured off helminthes infection	43.00±0.73[a]	83.33±4.30[b]
T_3 (N= 6) Control	1750.00±84.65	2166.66±133.77[b]	2600.00±121.10[b]	++ to +++ remained during period of observation	52.00±0.57[c]	33.33±7.45[a]

T_1 – Albendazole treated group

T_2 – Albendazole + mineral mixture treated group

T_3 – Infected untreated control

*G.I. helminths: *Haemonchus* sp., *Oesophagostomum* sp., *Ostertagia* sp., *Trichostrongylus* sp., *Trichuris* sp., *Marshallagia* sp., *Bunostomum* sp., *Strongyloides* sp.

affect the nutritional status and indirectly reproductive performance in goat.

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