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IMAPACT OF EOSINOPHILS IN IMMUNITY INDUCTION IN NEMATODE INFECTED GOATS

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ABSTRACT

Present study deals with the eosinophil count in the blood of nematode infected goats of farm house and slaughter house of Barwani, Sendhwa, Niwali, Pansemal and Khetia. The eosinophils values found increased in infected goats when compared to control. The results obtained indicated that the eosinophils have significance role in the immune system of host. The eosinophil action showed early host defense mechanism against helminth, which showed its effective role in nematode infection.

Keywords: Eosinophis, Immune system, Blood and Goat.

INTRODUCTION

Domestication of sheep and goats are ancient. These two animals are capable of withstand a long period of drought in comfortable way than any other livestock. Because goats can survive under limited fodder and water supply [1]. Sheep and goats are used as an important source of animal protein. Presence of gastrointestinal nematode infections in intestine is animportant parasitic disease which is responsible for the low productivity of small ruminant worldwide, especially in tropics and sub-tropics [2][3]. The nematode species like *Haemonchus contortus, Trichostrongylus colubriformis, Teladorsagia circumcincta* are affective small recombinants globally [4].

Thus, infections in such animals are of great economic value [6]. Productivity loss caused by parasitic infection is an important and common problem in small sized ruminant in major part of the world [5]. Commonly occurring gastrointestinal parasitic diseases in sheep and goats recorded are *Haemonchosis, Strongyloidosis, Ostertagiasis, Bunostomiasis, Oesophagostomiasis,* and *Trichostrongylosis.* Among the nematodes, *Haemonchus contortus* is the most significant. The degree of infestation observed were sub clinical or clinical, depending on load of parasites. In these two-category sub clinical infections were always dominant and dangerous because clinicians and owners are not able to recognize these parasites.

MATERIALS AND METHODS

MATERIALS

1. **Study area:** -The present investigation was done in BarwaniDistrict (M.P.). Total following five villages of Barwani district wasselected for the present study: -

(i) Barwani - latitude 22o 01’ 29.46” N and longitude 74o 55’ 4.98 E.
(ii) Sendhwa - latitude 21.6819o N and longitude 75.0943 o E.
(iii) Niwali - latitude 21.6827 o N and longitude 74.9216 o E.
(iv) Pansemal - latitude 21.6582 o N and longitude 74.6971 o E.

(v) Khetia - latitude 21.6709 o N and longitude 74.5859 o E.

2. Experimental animal: Goat **(*Capra hircus*)** was selected for thepresent investigation.

Study period: The survey was done conducted with followingseason: -

- Rainy- July to October,
- Winter - November to February,
- Summer – March to Jun,

3. Survey and Sample Collection: -The survey and samplecollection were done in 610 goats. 120 goats were analyzed from eachvillage selected for the present study.

Autopsy

The total numbers of goats 610 were observed in survey where 10goats were used for control and 120 goats were used for experimentalpurpose from each station i.e. Barwani, Sendhwa, Niwali, Pansemal andKhetia in experimental group's season wise 60 goats from slaughterhouse and 60 goats from farm house were considered for the further studyof regions.

METHODS

Collection of Blood: -The blood samples were collected from thejugular vein of each surveyed and selected goat with a sterile disposablesyringe under the supervision of veterinary doctor and with the farmer'spermission or consent. 5ml of blood sample was preserved inanticoagulant ethylene diamine tetra acetic acid (EDTA) contained inspecial vials and kept for further hematological, immunological andsample of blood without EDTA for biochemical studies. Serum wasseparated from blood and kept immediately in refrigerator at 4°c.

DIFFERENTIAL LEUKOCYTE COUNT BY LEISHMANNMETHOD [7]

Differential leukocyte count aims to determine the proportion ofdifferent kinds of leucocytes by examining a well stained peripheralblood smear. The different types of white blood cells seen in a peripheralblood film may be divided into following two broad groups: -

1. Granulocytes 2. Agranulocytes

RESULTS AND DISCUSSION

Table 1: Eosinophiles (%) in nematode infected goat (Farm house goats)in Rainy season.

Name of Village	Eosinophiles (%)			
	Control value (a)	Experimental values (mean values) (b)	Difference value (a-b)	Percent alter
Barwani	02.52 ±0.86	17.2 ±1.25	+14.68	+582.53
Sendhwa		16.8 ±0.78	+14.55	+646.66
Niwali		15.4±0.95	+12.88	+511.11
Pansemal		14.6±0.34	+12.08	+479.36
Khetia		14.0±0.26	+11.48	+455.55

Figure 1: Eosinophiles (%) in nematode infected goat (Farm house goats) in Rainy season.

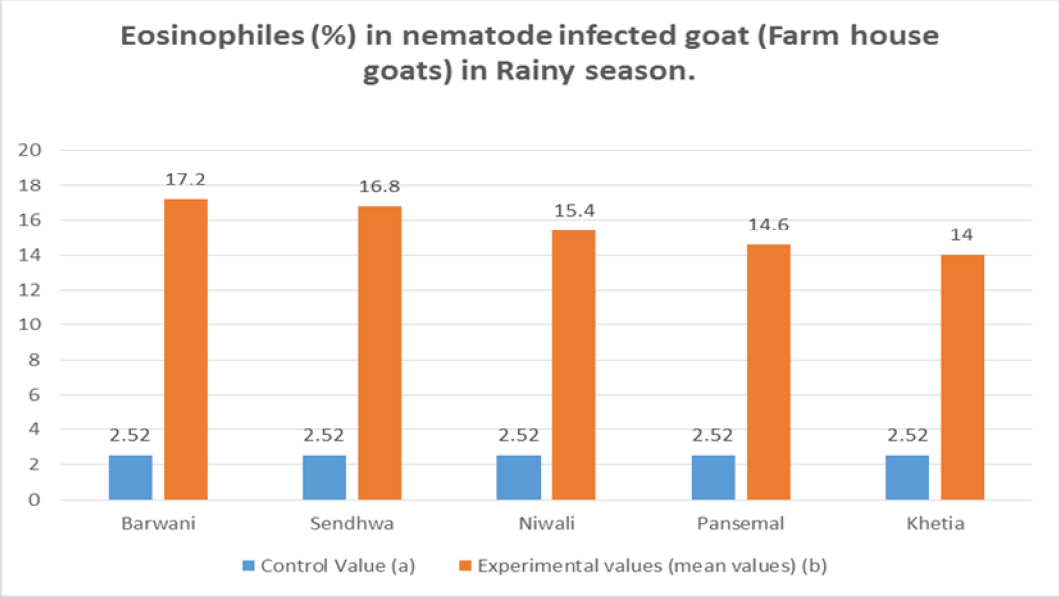


Table2: Eosinophiles (%) in nematode infected goat (Slaughter house goats) in Rainy season.

Name of Village	Eosinophiles (%)			
	Control value (a)	Experimental values (mean values) (b)	Difference value (a-b)	Percent alter
Barwani	02.52 ±0.86	18.6 ±0.64	++16.08	+638.09
Sendhwa		17.9 ±0.47	+15.38	+610.31
Niwali		16.9 ±0.43	+14.38	+570
Pansemal		15.2±0.25	+9.68	+384.12
Khetia		14.2±0.92	+11.68	463

Figure 2: Eosinophiles (%) in nematode infected goat (Slaughter house goats) in Rainy season.

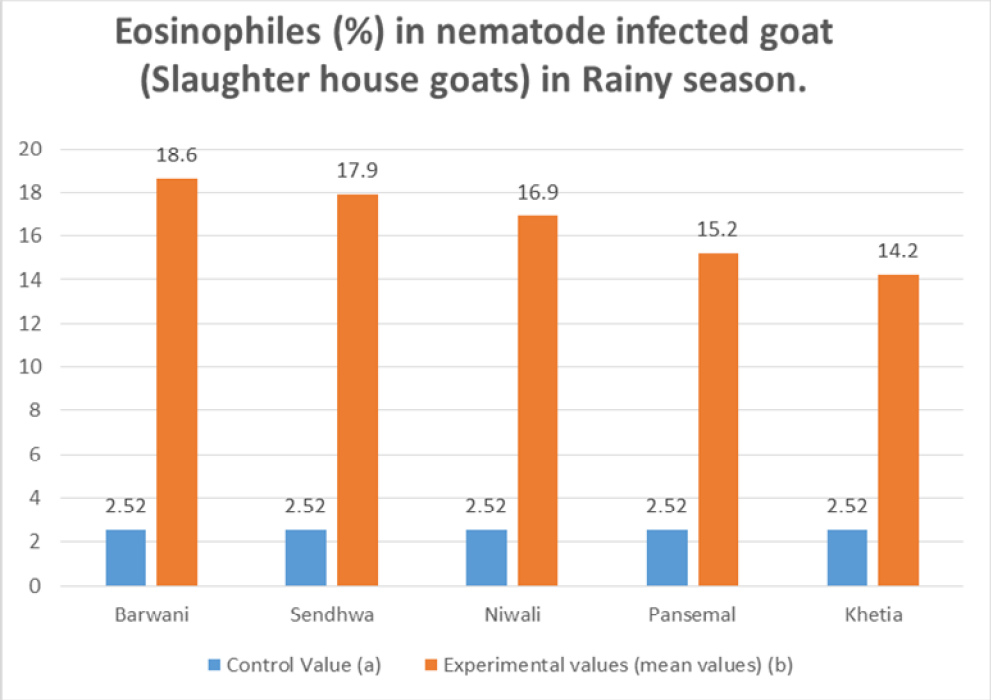


Table 3: Eosinophiles (%) in nematode infected goat (Farm house goats)in winter season.

Name of Village	Eosinophiles (%)			
	Control value (a)	Experimental values (mean values) (b)	Difference value (a-b)	Percent alter
Barwani	02.52 ±0.86	16.6 ±1.45	+14.08	+558.73
Sendhwa		15.6 ±0.14	+13.08	+519.04
Niwali		14.9±0.27	+12.38	+491.26
Pansemal		13.4±0.35	+10.88	+431.74
Khetia		12.6±0.72	+10.08	+444.68

Figure 3: Eosinophiles (%) in nematode infected goat (Farm house goats) in winter season.

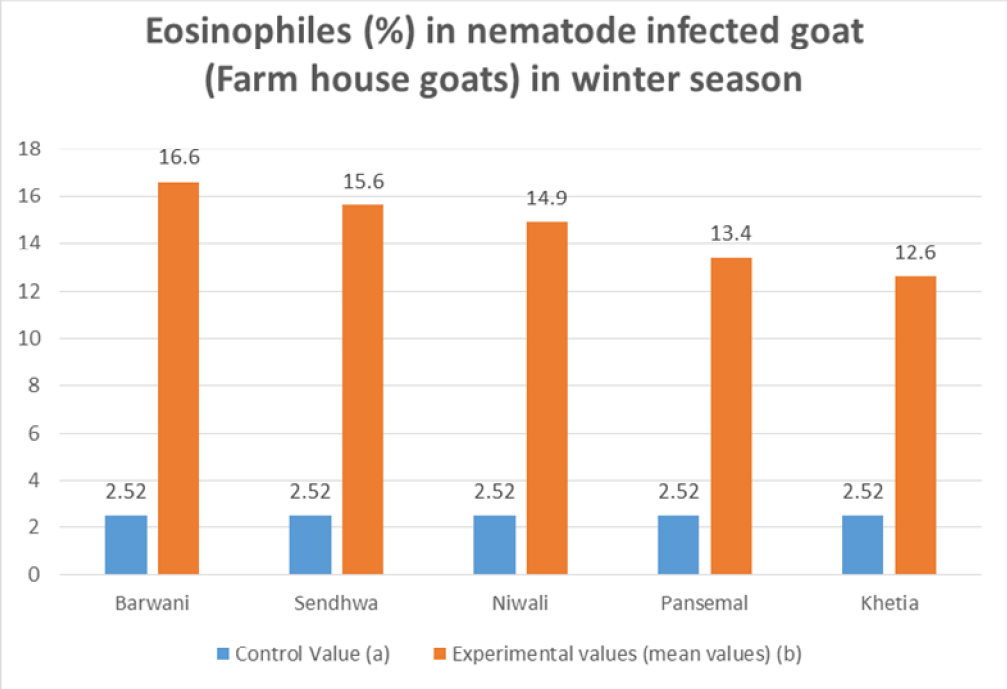


Table4: Eosinophiles (%) in nematode infected goat (Slaughter house goats) in winter Season.

Name of Village	Eosinophiles (%)			
	Control value (a)	Experimental values (mean values) (b)	Difference value (a-b)	Percent alter
Barwani	02.52 ±0.86	16.5 ±0.67	+13.98	+554.76
Sendhwa		16.2 ±0.87	+13.68	+542.85
Niwali		15.6 ±0.35	+13.08	+519.04
Pansemal		14.4±0.62	+11.88	+471.42
Khetia		13.6±0.12	+11.08	+439

Figure 4: Eosinophiles (%) in nematode infected goat (Slaughter house goats) in winter Season.

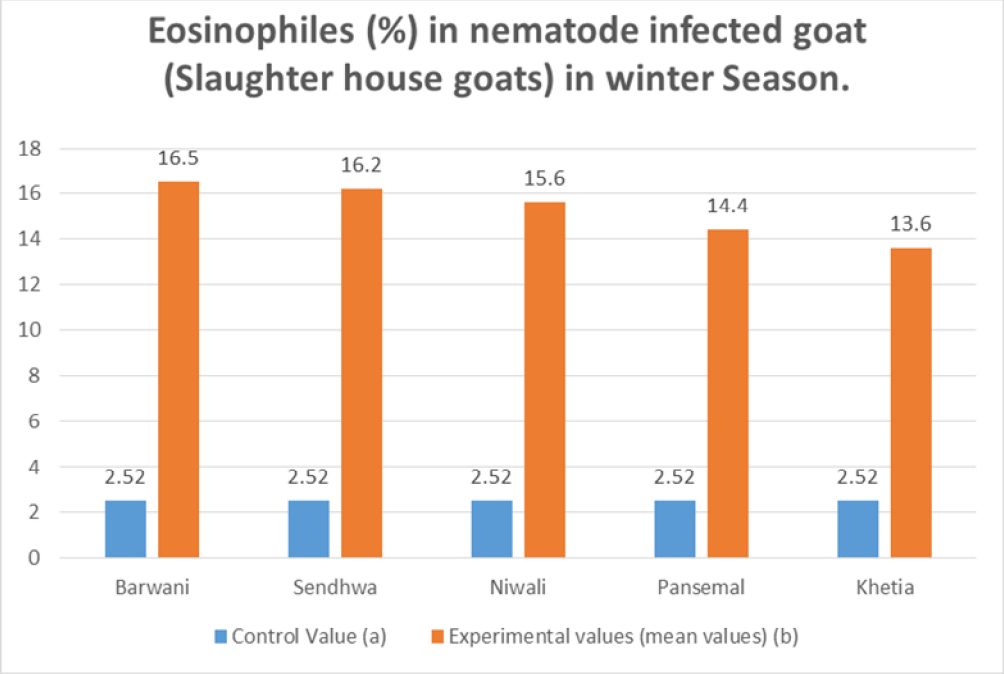


Table 5: Eosinophiles (%) in nematode infected goat (Farm house goats)in Summer season.

Name of Village	Eosinophiles (%)			
	Control value (a)	Experimental values (mean values) (b)	Difference value (a-b)	Percent alter
Barwani	02.52 ±0.86	15.2 ±0.35	+12.68	+503.17
Sendhwa		14.6 ±0.41	+12.08	+482.49
Niwali		14.2±0.43	+11.68	+463.49
Pansemal		13.0±0.47	+10.48	+415.87
Khetia		12.4±0.56	+9.88	+392.06

Figure 5: Eosinophiles (%) in nematode infected goat (Farm house goats) in Summer season.

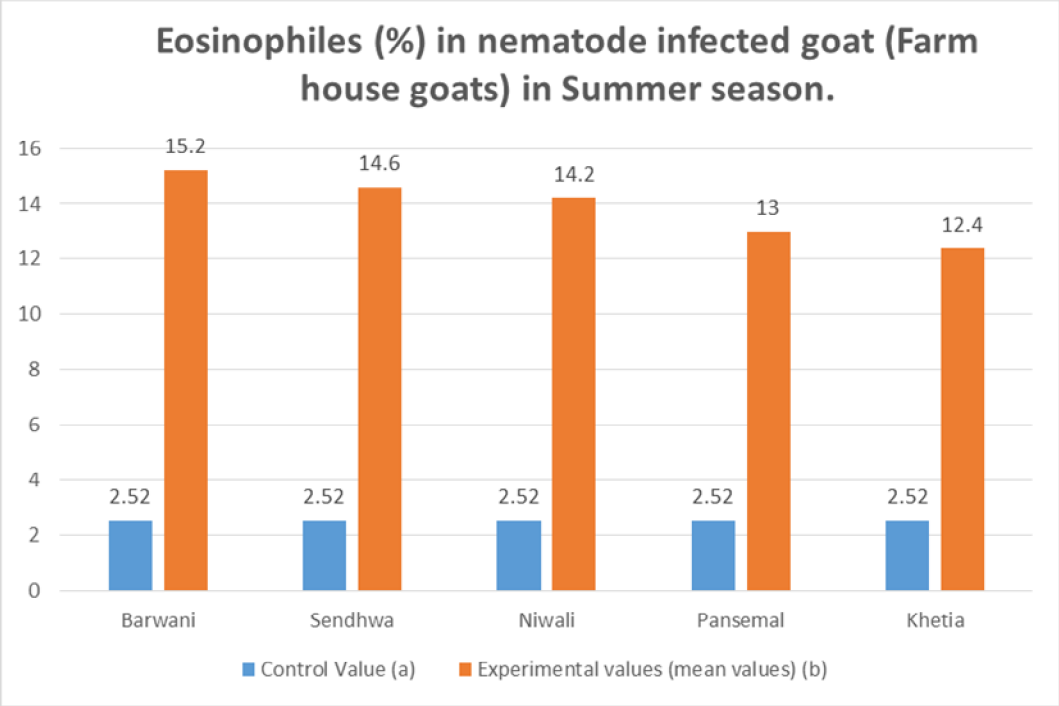
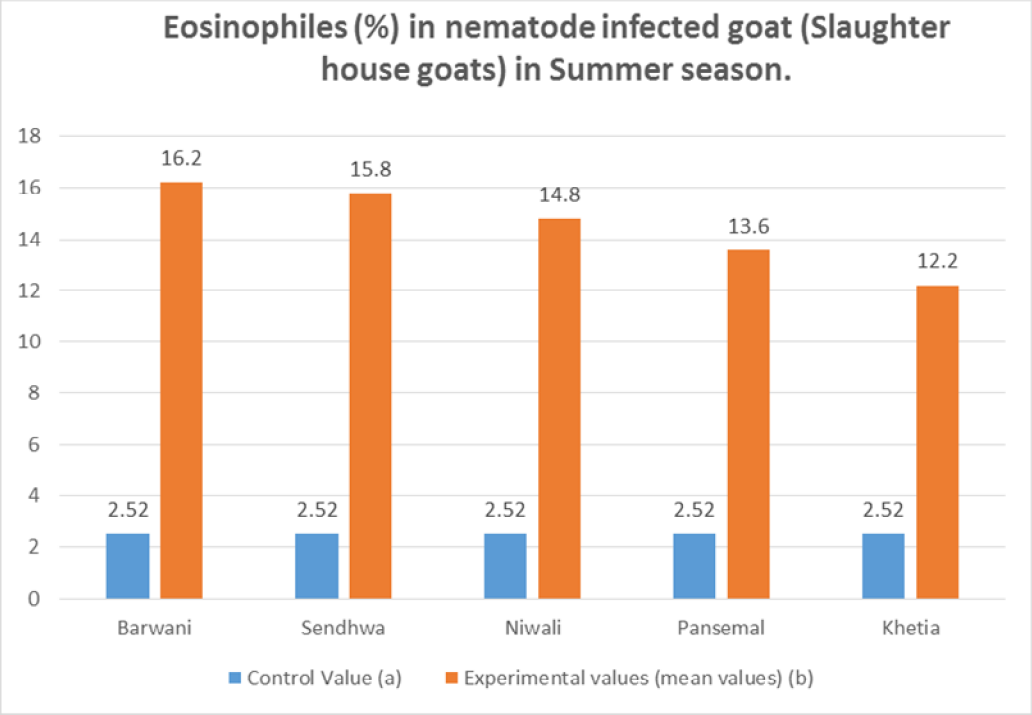


Table6: Eosinophiles (%) in nematode infected goat (Slaughter house goats) in Summer season.

Name of Village	Eosinophiles (%)			
	Control value (a)	Experimental values (mean values) (b)	Difference value (a-b)	Percent alter
Barwani	02.52±0.86	16.2 ±1.86	+13.68	+542.85
Sendhwa		15.8 ±0.58	+13.28	+526.98
Niwali		14.8 ±0.36	+12.28	+487.30
Pansemal		13.6±1.65	+11.08	+439.68
Khetia		12.2±0.15	+9.68	+384.12

Figure6: Eosinophiles (%) in nematode infected goat (Slaughter house goats) in Summer season.



Rainy Season

The Eosinophils values found increased in infected goats ascompare to control. The Eosinophils values of infected farm house goatswere 17.2, 16.8, 15.4, 14.6 and 14.0% at Barwani, Sendhwa, Niwali,Pansemal and Khetia respectively. The maximum eosinophils value17.2% was recorded at Barwani and the minimum Eosinophils value14.0% was found at Khetia.

The Eosinophils values of infected slaughter house goats were18.6, 17.9, 16.9, 15.2, and 14.2% at Barwani, Sendhwa, Niwali, Pansemaland Khetia respectively. The maximum Eosinophils value 18.6% wasnoted at Barwani and the minimum Eosinophils value 14.2% wasobserved at Khetia.

Winter Season

The Eosinophils values found increased in infected goats whencompared to control. The Eosinophils values of infected farm house goatswere 16.6, 15.6, 14.9, 13.6 and 13.4% at Barwani, Sendhwa, Niwali,Pansemal and Khetia respectively. The maximum Eosinophils value16.6% was observed at Barwani and the minimum Eosinophils value13.4% was noted at Khetia.

The Eosinophils values of infected slaughter house goats were16.5, 16.2, 15.6, 14.4 and 13.6% at Barwani, Sendhwa, Niwali, Pansemaland Khetia respectively. The maximum Eosinophils value 16.5% wasrecorded at Barwani and the minimum Eosinophils value 13.6% wasnoted at Khetia

Summer Season

The Eosinophils values found increased in infected goats whencompared to control. The Eosinophils values of infected farm house goatswere 15.2, 14.2, 14.2, 13.0 and 12.4% at Barwani,

Sendhwa, Niwali,Pansemal and Khetia respectively. The maximum Eosinophils value15.2% was found at Barwani and the minimum Eosinophils value 12.4%was found at Khetia.

The Eosinophils values of infected slaughter house goats were16.2, 15.8, 14.8, 13.6 and 12.2% at Barwani, Sendhwa, Niwali, Pansemaland Khetia respectively. The maximum Eosinophils value 16.2% wasfound at Barwani

Eosinophils are cell component of WBC. They are supposed to be responsible for destroying the metazoan parasites and allergic reactions. Increase in the number of eosinophils heave been recognized as characteristic features of infection of helminth[8]. Eosinophils act as regulatory cells to dampen down the inflammatory reaction caused by mast cells degranulation[9]. Eosinophils could kill the early helminth stage and found their role as major effecter cell in resistance to parasite infections [10] [11]. In most cases eosinophil-mediated killing was most effective against the parasite. For maximum killing capacity this required support antibody and complement[12] [13].

Biochemical and hematological tests are broadly used to monitorand evaluate health, nutritional and physiological status of ruminants [14] [15] [16] [17] [18]. Theestimation of blood parameters has also been used as a marker to judgethe efficacy of supplements and feed nutrient [19] [20] [21][22] and as an index toanalysis the transportation stress [23]. The biochemical and hematology profiles also help to assess the immunity level [24].

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