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Study on parasitic load in intensive and semi-intensive systems of goat rearing in Tamil Nadu

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Abstract

To study the evaluate on parasitic load of Egg Per Gram (EPG), Oocyst Per Gram (OPG) of 3-4 months 40 Tellicherry and 40 Salem Black kids were selected under intensive (T₁) and semi-intensive (T₂) system of rearing. The selected kids were divided in to treatment-1 (T₁ – 8 males and 12 females) and treatment-2 (T₂ – 8 males and 12 females) in each breed. The EPG of Tellicherry kids was 0 to 1316.67 ± 418.26 intensive and semi-intensive system. In Salem Black kids, the EPG 33.33 ± 21.08 and 1016.67 ± 360.01, intensive and semi-intensive system, respectively. Corresponding values of OPG was 2250.00 ± 535.87 and 1500.00 ± 73.03, respectively and in Salem Black 2533.33 ± 379.68 and 1833.33 ± 42.16, respectively. The study concluded that the Oocyst per Gram was high in intensive feeding group than semi-intensive group, while the Egg Per Gram was high in semi-intensive group.

Keywords: Egg per gram, intensive, Oocyst per gram, parasitic load, semi-intensive

Introduction

Goats were among the first farm animals to be domesticated (Ensminger and Parker, 1986) [4]. In developing countries, goats make a very valuable contribution, especially to the poor people in the rural areas for generating employment, income, capital storage and improving household nutrition (Devendra, 1992) [3]. Goat is the best alternative for cows and buffaloes in places where undulating lands are unsuitable for large animal farming. The following constraints viz., adverse climatic change, shrinkage of agricultural field, and shortage of labors limits goat farming in rural areas. The productivity of goats under the prevailing traditional production system is very low (Singh and Shalander Kumar, 2007) [9]. It is because they are maintained under the extensive system on natural vegetation on degraded common grazing lands and tree lopping. Even these degraded grazing resources are shrinking continuously. Therefore, goat rearing took a shift to intensive from conventional systems to meet the demand of chevon in domestic as well as in international markets. However, there was no detailed study on parasitic load of Tellicherry and Salem Black kids under intensive and semi-intensive system. Hence, the present study was carried out to study the parasitic load of Tellicherry and Salem Black kids under intensive and semi-intensive systems of rearing in Tamil Nadu.

Materials and Methods

The study was carried out at Instructional Livestock Farm Complex, Veterinary College and Research Institute, Namakkal, Tamil Nadu, India. The study area is generally semi-arid to sub-humid regions with frequent occurrence of drought. 40 Tellicherry and 40 Salem Black kids under the age of 3-4 months were selected for this study. The selected kids were divided into Treatment - 1 (T₁ - 8 males and 12 females) and Treatment – 2 (T₂ – 8 males and 12 females) each breed. The T₁ was kept under an intensive system of rearing and another group under semi-intensive system of rearing (T₂) throughout the study period. Animals were given an adaptation period of 15 days before the start of the experiment. Deworming was done once in three months with broad-spectrum anthelmintics (Fenbendazole with Praziquantel. T₂ was sent for grazing in both breeds which were allowed for grazing from 9.00 a.m. to 4.30 p.m. The T₁ group was kept under stall feeding. Stall-fed animals were offered concentrate feed, Co-4 grass (Bajra X Napier hybrid variety), subabul (*Leucaena leucocephala*), sorghum (*Sorghum bicolor*) stover and ground nut haulms (*Arachis hypogaea*) at different times of the day. All the experimental animals were fed with concentrate feed as per the standard ICAR (2013) requirement based on their age and body weight. All four groups were housed in an open type of housing with an asbestos-roofed, earthen floor shed with partition made of chain link.

Faecal samples were collected once in a month in six randomly selected animals and the faecal Egg Per Gram (EPG) and Oocyst Per Gram (OPG) counts were made by McMaster technique (Coles *et al.*, 1992) [2]. It was analyzed the standard statistical procedures.

Result and Discussion

Faecal egg count (Eggs per gram) in Tellicherry kids

The faecal samples were screened every month to find out parasitic infection if any in the intensive and semi-intensive systems of management and are furnished in Table 1.

Table 1: Mean (\pm SE) number of Eggs Per gram (EPG) of Tellicherry kids under intensive and semi-intensive systems of rearing

Period	Intensive system (T ₁)	Semi-intensive system (T ₂)	t-value	p-value
Initial [#]	50.00 \pm 34.16	216.67 \pm 124.94	2.493 ^{NS}	0.067
30 days	33.33 \pm 21.08 ^a	316.67 \pm 94.57 ^b	2.924 [*]	0.016
60 days	50.00 \pm 22.36 ^a	1083.33 \pm 142.40 ^b	7.168 ^{**}	0.000
90 days	33.33 \pm 21.08 ^a	666.67 \pm 125.61 ^b	4.973 ^{**}	0.002
120 days	0 ^a	350.00 \pm 76.38 ^b	4.583 ^{**}	0.002
150 days	50.00 \pm 22.36 ^a	1316.67 \pm 418.26 ^b	3.024 [*]	0.014

Means bearing the different superscript within a row differ significantly, *Significant ($p < 0.05$), **Highly significant ($p < 0.01$). # Initial at the start of the trial (3-4 months)

The table revealed that the eggs per gram ranged from 0 to 1316.67 \pm 418.26 during the five-month experimental period. Intensively-reared kids had significantly ($p < 0.05$) lower eggs per gram than semi-intensively-reared kids throughout the study period.

Faecal egg count (Eggs per gram) in Salem Black kids

The level of eggs per gram (EPG) of faecal sample of Salem Black goats under intensive and semi-intensive systems were analysed and are presented in Table 2.

Table 2: Mean (\pm SE) number of eggs per gram of Salem Black goats under intensive and semi-intensive systems of rearing

Period	Intensive system (T ₁)	Semi-intensive system (T ₂)	t-value	p-value
Initial [#]	66.66 \pm 33.33	150.00 \pm 42.82	1.536 ^{NS}	0.079
30 days	33.33 \pm 21.08 ^a	233.33 \pm 61.46 ^b	3.078 [*]	0.010
60 days	116.67 \pm 47.72 ^a	1016.67 \pm 360.01 ^b	2.478 [*]	0.028
90 days	50.00 \pm 34.16	216.67 \pm 124.94	1.287 ^{NS}	0.123
120 days	83.33 \pm 30.73 ^a	650.00 \pm 76.38 ^b	6.883 ^{**}	0.000
150 days	66.67 \pm 33.33 ^a	566.67 \pm 42.16 ^b	9.303 ^{**}	0.000

Means bearing the different superscripts within a row differ significantly, *Significant ($p < 0.05$), ** Highly significant ($p < 0.01$), ^{NS}Non significant. #Initial at the start of the trial (3-4 months)

The EPG ranged from 33.33 \pm 21.08 to 1016.67 \pm 360.01 on 30 days in intensive system and 60 days in semi-intensive system. Under intensive system of management, the eggs per gram were found to be significantly ($p < 0.01$) lesser than semi-intensive system during the 120 and 150th day study periods. Whereas, it were not significant for the period of start of the trial and 90 days, though the values are numerically lower in intensive system compared to semi-intensive system. The results indicated that the semi-intensive group had high EPG count in both the breeds than the intensive group and is in close agreement with the earlier reports on different sheep and goat breeds of India (Moniruzzaman *et al.*, 2002; Richard

Jegadeesan *et al.*, 2003; Cai and Bai, 2009) [7, 8, 1].

Faecal Oocyst count (Oocysts per gram) in Tellicherry kids

The mean (\pm SE) of Oocysts Per Gram (OPG) of Tellicherry kids under intensive and semi- intensive systems are presented in Table 3.

Table 3: Mean (\pm SE) number of Oocysts per gram of Tellicherry goats under intensive and semi-intensive systems

Period	Intensive system (T ₁)	Semi-intensive system (T ₂)	t-value	p-value
Initial [*]	1833.33 \pm 383.55	1150.00 \pm 150.00	1.659 ^{NS}	0.074
30 days	2033.33 \pm 402.21	1400.00 \pm 51.64	1.562 ^{NS}	0.089
60 days	2116.66 \pm 418.26	1716.66 \pm 30.73	0.954 ^{NS}	0.192
90 days	2250.00 \pm 535.87	1550.00 \pm 67.08	1.296 ^{NS}	0.126
120 days	2116.66 \pm 386.79	1933.33 \pm 42.16	0.471 ^{NS}	0.329
150 days	1900.00 \pm 226.56	1500.00 \pm 73.03	1.680 ^{NS}	0.072

^{NS} Non-significant, * Initial at the start of the trial (3-4 months)

The initial mean number of Oocysts in intensive and semi-intensive groups was 1833.33 \pm 383.55 and 1150.00 \pm 150.00 numbers, respectively. Intensively reared goats had higher Oocyst count (ranged between 1833.33 and 2250. 00) than semi- intensive group (ranged between 1150.00 and 1933. 33). Under intensive system, the OPG was higher at 30, 60, 90, and 120 days with maximum OPG at 90 days (2250.00 \pm 535.87). Similarly, under semi-intensive system, the maximum OPG (1933.33 \pm 42.16) was at 120 days. Statistical analysis failed to reveal significance in the values between rearing systems.

Faecal Oocyst count (Oocysts per gram) in Salem Black kids

The mean (\pm SE) Oocysts per gram of Salem Black goats under intensive (T₁) and semi-intensive systems (T₂) are presented in Table 4.

Table 4: Mean (\pm SE) number of Oocysts per gram of Salem Black goats under intensive and semi-intensive systems of rearing

Period	Intensive system (T ₁)	Semi-intensive system (T ₂)	t-value	p-value
Initial [*]	1533.33 \pm 135.81	1250.00 \pm 150.00	1.400 ^{NS}	0.095
30 days	2016.66 \pm 385.93	1533.33 \pm 66.67	1.234 ^{NS}	0.136
60 days	2233.33 \pm 429.47	1850.00 \pm 42.81	0.888 ^{NS}	0.208
90 days	2016.66 \pm 295.99	1650.00 \pm 67.08	1.208 ^{NS}	0.136
120 days	2533.33 \pm 379.18	1833.33 \pm 42.16	1.834 ^{NS}	0.062
150 days	2383.33 \pm 425.37	1666.66 \pm 61.46	1.667 ^{NS}	0.078

^{NS} Non significant, * Initial at the start of the trial (3-4 months)

The initial mean of Oocysts in T₁ and T₂ groups was 1533.33 \pm 135.81 and 1250.00 \pm 150.00 numbers, respectively. Higher OPG was noticed in intensively reared group than semi-intensive group. Throughout the experimental period, the OPG was numerically higher in T₁ group than T₂ group. The OPG count observed in the Tellicherry and Salem Black goats showed that the kids reared under intensive system had numerically high count when compared to semi-intensive system of management in both the breeds. It is in accordance with the earlier reports (Khan *et al.*, 1997; Moniruzzaman *et al.*, 2002) [7]. Continuous shedding of Oocysts by the adult carrier coupled with conducive microclimate might be the reason for persistent infection and numerically high OPG in intensive system.

Conclusion

Animals under semi-intensive rearing have the risk of picking up infection from contaminated pasture and they are constantly exposed to reinfection. Whereas, intensive animals which are fed with cultivated green fodder and dry fodders which are relatively free from contamination. The OPG was high in intensive feeding group than semi-intensive group, while the EPG was high in semi-intensive group.

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