World Applied Sciences Journal 11 (7): 803-807, 2010
ISSN 1818-4952

Preliminary Study on Major Health Problems of the Newly Introduced Boer Goat Breed in Ethiopia

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Abstract: A study was conducted on 60 newly introduced Boer goats breed at Adami Tulu Agricultural Research Center (ATARC) Nucleus site to identify the major health problems since their introduction to Ethiopia. Purposive sampling for clinical and laboratory examinations and secondary data collection were used. Out of 60 Boer goats, 26.0% of them were found to be affected by either one or more of the major health problems. The relative prevalence of the disease problems in Boer goats was found to be 53.3%. GIT parasites, keratoconjunctivitis, ticks, respiratory problems and local abscess with their respective prevalence of 35.0, 20.0, 15.0, 11.7 and 10.0% were found to be the major health problems of Boer goats at ATARC. The result of the secondary data analysis also showed high prevalence (42.2%) of major health problems in Boer goats being respiratory problems, gastrointestinal parasites, local abscess, diarrhea and orf as the major diseases affecting them. The occurrences of the problems were not significantly affected by age and sex of Boer goats. The high prevalence and diversity of health problems in Boer goats underline the importance of further studies at nucleus site and farm conditions in line with the identification of the different disease agents to design effective prevention and control strategies before the distribution of Boer goats to farmers.

Key words: GIT parasites % Keratoconjunctivitis % Ticks % Respiratory problems % Boer goats

INTRODUCTION

Even though, the country, Ethiopia is endowed with substantial potential for animal production [1], several reports have shown that there are increased domestic demands for animal products due to population growth. Despite the huge potential, there is a chronic shortage of the livestock product in most part of the country arising mainly from poor productivity of the local breeds, poor husbandry and herd health management and shortage of feed [2]. Boer goat breeds are the most selected breeds for meat purpose, as a result this breeds were used in overseas countries to improve the growth and meat characteristics in local goat breeds [3]. Due to this fact, the government of Ethiopia imported Boer goat breeds from South Africa to cross with the local goat breeds and distribute them for farmers to upgrade the productivity of local breeds.

It has been reported that there are several important goat diseases occurring in South Africa that inflict major socio economic losses. Among them, the most prevalent health problems recorded were pneumonia, foot rot, internal parasites, nasal worms, certain clostridial diseases, abscessation, orf and certain ectoparasites to which, a lesser extent, Boer goat breeds may also be more susceptible than Indigenous goats [4, 5]. Disease is one of the most important constraints that hinder the productivity of sheep and goats in sub-Saharan African countries [6]. Even though, the Boer goat breeds come with much cost, new for the environment, their major health problems have not been yet studied under Ethiopian condition since their importation. Therefore, this study was under taken to identify the major health problems of Boer goats at Adami Tulu Agricultural Research Center at Nucleus site since their importation from South Africa under Ethiopia climatic condition.

MATERIALS AND METHODS

Description of the Study Area: The study was conducted from October 2008 to April 2009, at Adami Tulu Agricultural Research Center (ATARC).

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ATARC is located in the mid rift valley, 167 Km south of Addis Ababa in Oromia National Regional State. It lies at latitude of 7°9'N and longitude of 38°7'E at an elevation of 1650 m above sea level. The study area has a relative humidity of 60% and receives average annual rainfall of 760.9 mm with minimum and maximum average annual temperatures of 12.7°C and 27.2°C, respectively [7].

Study Design and Sampling Methods: A study was conducted on 60 Boer goats (adult and kids) at ATARC Nucleus site. Adult goats are those aged above 1 ½ years and kids are goats aged less than 1 ½ year [8].

Study Methodology: All goats included in the study were thoroughly examined for any abnormality/health problem. Detail clinical and laboratory examinations were made on those goats found abnormal for inspection [8]. Laboratory examination was conducted only for parasitic problems (GIT parasites and ticks), while the other problems were investigated based on their clinical manifestations.

Fecal sample was collected from all goats included in the study. For those goats found positive for parasitic egg, number of Eggs Per Gram (EPG) of fecal sample was counted and the level of parasitic infection determined as lightly (if EPG from 50 to 799), moderately (EPG from 800 to 1200) and heavily (EPG > 1200) [8]. At the same time, all goats were also examined for tick infestation and skin diseases. From those goats found positive for tick, the ticks were collected (from the tail, udder and shoulder of goats) and then identified into different genera [9]. Additionally, a one year secondary data (from October, 2007 which is introduction time of the Boer goats into ATARC, to October, 2008) was collected from case book inline with the major health problems of the goats included in the study to determine the major health problems of these goats before this study.

Data Collection: The individual goat's identification (tag) number and their sex were recorded for data collection (both active and secondary data). Age category was given by using the recorded data and the Boer goats included in this study were categorized into kids and adult goats [8].

Data Analysis: Prevalence was defined as the number of goats found positive for any of the major health problems per 100 goats examined. Chi-square test statistic was used to estimate the association of prevalence of major health problems with age and sex of the goats examined [10]. In all analysis, confidence level was held at 95% and $P < 0.05$ was set for significance.

RESULTS

Major Health Problems of Boer Goats at ATARC: Of the total Boer goats examined, 53.3% of them were found to be affected either with one or more of the major health problems. Major health problems encountered during the study period were GIT parasite, keratoconjuctivitis, ticks, respiratory problems and local abscess with respective prevalence of 35.0%, 20.0%, 15.0%, 11.7% and 10.0% (Table 1).

An attempt was made to determine the severity of GIT parasite infection based on EPG count. The majority of the infected goats were lightly affected (47.62%), followed by moderate (38.10%) and heavy (14.28%) degrees of infection. The prominent ticks affecting the Boer goats were also identified and tick infestation was found in 15.0% of the goats among which 55.5% was contributed by mixed infestation with two genera of ticks (*Hyalomma* and *Amblyoma*). Higher prevalence of GIT parasite was obtained in female goats (40.4%) as compared to male goats (15.4%), but the difference was not statistically significant ($X^2 = 2.81$; $P > 0.05$) (Table 2).

Table 1:Major and minor health problems and their relative and over all prevalence in Boer goats with different age groups

	Age Group & prevalence		
Major health problems	< 6 months age (Kids) (N = 10)	Adults (N = 50)	Overall prevalence (N = 60)
GI Parasite	3.0	18.0	35.0
Keratoconjuctivitis	8.0	4.0	20.0
Ticks	6.0	3.0	15.0
Respiratory problems	5.0	2.0	11.7
Local abscess	0	6.0	10
Orf	0	2.0	3.3
Arthritis	1	0	1.7
Tumor	0	1.0	1.7
Abortion	0	1.0	1.6

Table 2: Prevalence of GIT parasites and ticks in Boer goats at ATARC Nucleus Site by sex and age.

	Sex & Number affected			Age & Number affected		
Health problems	Female (N=47)	Male (N=13)	Total (N=60)	Adult (N=50)	Kid (N=10)	Total (N=60)
GIT Parasite	19	2	21	18	3	21
Light	6	0	10	9	1	10
Moderate	4	1	8	7	1	8
Heavy	2	1	3	2	1	3
Ticks	6	3	9	3	6	9
Amblyomma	2	1	3	1	2	3
Hyalomma	4	2	6	2	4	6
Amblyoma&Hyalomma	5	0	5	2	3	5

N = Total number of Boer goats examined Figure 1: Prevalence of major health problems of Boer goats as analyzed from secondary data.g3

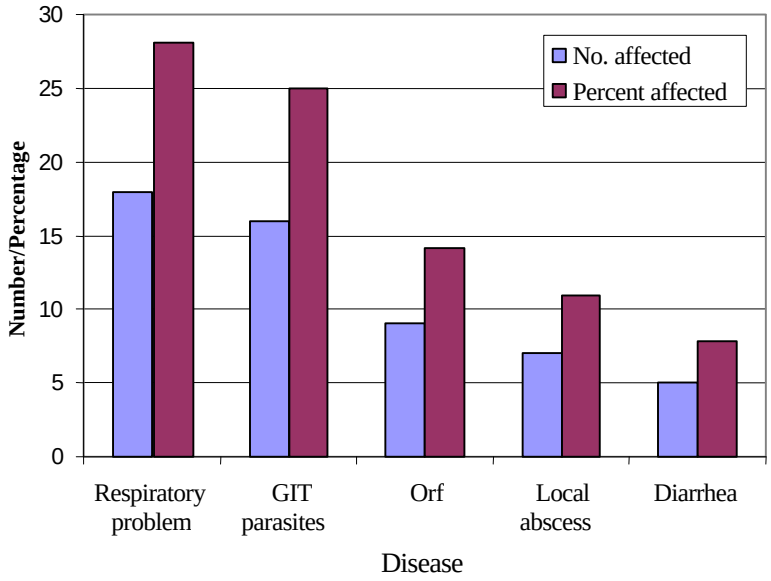

Fig. 1: Prevalence of major health problems of Boer goats as analyzed from secondary data

According to the result of secondary data analysis on health problems of Boer goats, 42.2% of them were found to be affected by either one or more the health problems. Respiratory problems, GIT parasites, local abscess, diarrhea and orf were found to be the major diseases affecting the Boer goats at ATARC (Figure 1).

DISCUSSION

GIT parasites, keratoconjuctivitis, ticks, respiratory problems and local abscess were identified as the major health problems of Boer goats at ATARC Nucleus site since their introduction to Ethiopia. This finding is slightly similar with the most prevalent health problems of these animals under their accustomed environment in South Africa where orf, nasal worms, pneumonia, foot rot, internal parasites, certain clostridial diseases, abscessation and certain ectoparasites were reported by Bath *et al*. [4], Lusweti [5] and [14] indicating that agro-ecology could have an impact on distribution of disease causing organisms.

The prevalence of GIT parasites in Boer (34.7%) goats was lower than the previous works in the country by Ahmed [11] and Geremew [12] who reported 96.55% and 93.29%, respectively. This variation in prevalence rate may be due to the direct relationship of prevalence for humidity and temperature for the previous works. Besides, due to the fact that, in this study goats are reared separately from other domestic animals together with the better management practices which might have contributed for the lower prevalence obtained. This is in agreement with the previous reports in different areas that suggested, keeping different animals together could be the cause for increasing the degree of pasture contamination leading to higher prevalence rate of infection [13-15].

In this study the prevalence of gastrointestinal parasites in Boer goats in the different age groups has indicated that it is higher in adults (36%) than kids (30%). The higher prevalence in adults coincides with the previous report made by Mohamed [16] in which the prevalence was found to be 64.02% and 45.28% in local goats, adults and kids, respectively. Our finding also agrees with the report from South Africa, Gambia and semi arid parts of Kenya that reported higher prevalence rate in adult sheep and goats [14, 17, 18]. But the present finding does not agree with the one reported by Gamble and Zajac [19] and by Caldilz and his colleagues [20] in that younger shoats were more susceptible to internal parasitic infection than adults older than one year. The more susceptibility of younger goats in previous report may be due to the fact that adult animals may acquire immunity to the parasite through frequent challenge and expel the ingested parasite before they establish infection [21].

In this study, based on the sexes of Boer goats, the prevalence of gastrointestinal parasites in females and males were 40.4% and 15.4%, respectively in which case the prevalence was higher in females than males. This coincides with the one reported by Sissay [22], 84.34% for females and 67.8% for male and the one reported by Mohamed [16] in which 67.03% for female and 45.28% for male goats.

The present finding revealed that 53.3% of Boer goats were infected with one or more of the major health problems. *Amblyomma* and *Hayalomma* ticks were the only observed ticks which coincide with the previous report by Seyoum [9] who reported the prevalence of *Amblyomma* and *Hayalomma* to be 59.5% and 34.5%, respectively. The prevalence of ticks in female and male Boer goats was 12.8% and 23.1%, respectively showing no difference in tick infestation in sex groups. But remarkable difference was recorded in the prevalence of ticks in relation to the different age groups of the Boer goats in which adults were less affected (6%) than kids (60%).

In conclusion, the high prevalence of major health problems of Boer goats obtained during this study showed the importance of the major health problems for detailed further studies and design for appropriate and effective disease control strategies before the distribution of Boer goats to farmers for crossing with the local goats to improve their productivity.

ACKNOWLEDGEMENTS

The authors would like to acknowledge Adami Tulu Agricultural Research Center for the facility and technical support they received from the center.

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