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Major health problems of the Boer goats introduced in Bugenyuzi agriculture and livestock research center, Karusi Province of Burundi

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ABSTRACT

Aim: The study was aimed to identify the main health problems of the Boer goats since their introduction in Karusi Province.
Method and materials: Study was conducted on 60 newly introduced Boer goats in Bugenyuzi Agriculture and Livestock Research Center. Purposive sampling for clinical and laboratory examinations and secondary data collection were used.
Results: Out of the 60 Boer goats used, 26.0% were found to be affected by one or more of the major health problems encountered. The relative prevalence of the disease problems in Boer goats was found to be 53.3%. Gastrointestinal parasites, keratoconjunctivitis, ticks, respiratory problems, and superficial abscesses were found to be the major health problems of Boer goats at Bugenyuzi Agriculture and Livestock Research Center with respective prevalence rates of 35.0, 20.0, 15.0, 11.7, and 10.0%. The occurrence of these problems was not significantly affected by the age or sex of the goats.
Conclusion: The high prevalence and diversity of health problems in Boer goats call for further investigations at Bugenyuzi Agriculture and Livestock Research Center towards a thorough identification of the different disease conditions and their respective causes followed by designing effective prevention and control strategies prior to the distribution of these goats to farmers.

Keywords: Boer goats, GIT parasites, keratoconjunctivitis, ticks, respiratory problems.

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Introduction

Goats make a significant contribution to the maintenance of household stability, even for distressed women. They have been recognized as having a high potential for poverty alleviation and improved livelihoods for farmers in remote areas in arid and semi-arid areas (LLP, 2006; Nyathi, 2008). Several reports have shown that there are increased domestic demands for animal products due to population growth in Burundi (MINAGRI, 2017). Goats provide milk, meat, manure and skins and are used for social purposes such as a gift during parties and are also used for dowry in pygmy communities.

Despite the huge potential, there is a chronic shortage of livestock production in most parts of the country arising mainly from poor productivity of local breeds, poor husbandry and inadequate health management, as well as shortage of feed. Karusi province is endowed with substantial potential for animal production (Solomon, et al., 2010).

Boer goats are primarily selected for meat purposes; as a result, this breed is used in many countries to improve the growth and meat characteristics of local goat breeds (Bath et al., 2005). Based on this, the government of Burundi imported Boer goats from South Africa to crossbreed them with local goat breeds and distribute the crosses to famers to boost the productivity of local breeds. It has been reported that there are several important diseases affecting goats in Bugenyunzi district that cause major socio-economic losses. These include gastro-intestinal parasites, keratoconjuctivitis, ticks, respiratory problems, superficial (and sometimes deep) abscesses, pneumonia, foot rot, certain clostridal diseases and orf. It was also reported that Boer goats are more susceptible to these diseases than indigenous goats. Diseases constitute

one of the most important constraints that hinder goat production in Burundi. Even though Boer goats came at a high cost and found themselves in a new environment, their major health problems have not yet been studied under Burundian conditions. Therefore, this study was undertaken to identify the main health problems of Boer goats at Bugenyuzi Agriculture and Livestock Research Centre since their importation from South Africa in 2017.

Materials and Methods

The study was conducted at Bugenyuzi Agriculture and Livestock Research Centre, Karusi province (Burundi), situated at an average altitude of 1650 meters above sea level, and bordered with Gitega, Muyinga, Ngozi and Cankuzo Provinces. It was carried out from July to December 2019 where the two main seasons (dry and rainy) were catered for. The site is covered mainly by sparsely vegetated savannah grasslands; there are two dry seasons and two rainy seasons. The first rainy season runs from October to December and the second is from February to April. The dry season runs from May to end of September. Average temperatures ranges from 19^0C to 28^0C. Karusi province has both local goats and introduced Boer goats. The largest number of goats in Karusi is found in Bugenyuzi district, the reason why it was chosen for this study.

Sampling Method: The study was conducted on 60 Boer goats (adult and kids) selected randomly at Bugenyuzi Agriculture and Livestock Research Centre. Adult goats are those aged above 1.5 years, while kids are goats aged less than 1.5 years.

Study Methodology

All goats included in the study were thoroughly examined for any abnormality/health problem. On one hand, clinical examination by using semiology was done on all goats included in the study, while detailed clinical examination was done on goats found with abnormalities. On the other hand, laboratory examination was conducted for goats found (or suspected) to have parasitic problems (gastrointestinal parasites) using sedimentation and blood examination for ticks borne disease.

For goats which had parasites, the types of parasites were determined and the number of eggs per gram (EPG) was counted; thus, the level of parasitic infestation was qualified as light (for EPG from 50 to 799), moderate (EPG from 800 to 1200) or heavy (EPG > 1200) as suggested by Ahmed (1998). At the same time, all goats were also examined for tick infestation and skin diseases. For goats that had ticks, these were collected (under the tail, on the udder and the shoulders as well as inside the ears) and then identified into different genera (Adriano, 2006). Prior to the clinical examination and sample collection for parasitological analysis, secondary data analysis was done (from 2017, the year of Boer goats' introduction at Bugenyuzi) to find out preliminary major health problems faced by these goats.

Data Collection

The individual goat's identification (tag) number and their sex were recorded for data collection (both primary 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. The results of clinical examination and those of laboratory analysis were also recorded.

Data Analysis

The prevalence was defined as the number of goats found positive for any of the major health problems per 100 goats examined. Chi-square test was used to estimate the association of prevalence of major health problems with age and sex of the goats examined (Nbichomo et al., 2004). In all analysis, confidence level was held at 95% and $P< 0.05$ was set for significance.

Results and Discussion

Clinical Examination

Out of total Boer goats examined, 53.3% goats were found to be affected either by one or more of the major health problems. Major health problems encountered during the study period were GIT parasites, keratoconjuctivitis, ticks, respiratory problems and local abscess with respective prevalence of 35.0%, 20.0%, 15.0%, 11,7% and 10.0% (Table 1).

GIT parasites, keratoconjuctivitis, ticks, respiratory problems and local abscesses were identified as the main health problems of Boer goats at Bugenyuzi Agriculture and Livestock Research Centre since their introduction to Karusi province in 2017. These findings were slightly similar with those reported by Bath et al. (2005), Lusweti (2000) and Gamble and Zajac (1992) who found that the most prevalent health problems of these goats under their accustomed environment in South Africa where orf, nasal worms, pneumonia, foot rot, internal parasites, certain clostridial

diseases and certain ectoparasites. The same authors indicated that agro-ecology could have an impact on the distribution of disease-causing organisms.

The prevalence of GIT parasites in Boer goats (34.7%) was lower than the one found in previous works in the country by Mohamed (2008) and Frische et al. (1993) who reported 96.55% and 93.29%, respectively. This variation in the prevalence rate may be due to the direct relationship between humidity and temperature for the previous works.

Laboratory Examination

The types of Gastrointestinal parasites found were Strongyloidessp and Taeniasaginata.

An attempt was made to determine the severity of GIT parasite infestation based on EPG count. The majority of the infected goats were lightly affected (47.62%), followed by those moderately affected (38.10%) and then heavily affected goats (14.28%). The prominent ticks affecting the Boer goats were also identified and tick infestation was found in 15.0% of the goats. The main tick genera identified were *Hyalomma* and *Amblyomma* of all the infested cases (55.5% accounted for mixed infestation). The prevalence of GIT parasites was higher 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: Health problems of Boer goats and their prevalence at Bugenyuzi Agriculture and Livestock Research Centre

Major health problems	<6 months age (kids) (N=10)	Adults (N=50)	Total positive (N60)	Overall prevalence (%)
GIT Parasites	3.0	18.0	35.0	58
Kerato-conjunctivitis	8.0	4.0	20.0	30
Ticks	6.0	3.0	15.0	25
Respiratory problems	5.0	2.0	11.7	19.5
Local abscesses	0	6.0	10	16.6
Orf	0	2.0	3.3	5.5
Arthritis	1	0	1.7	2.8
Tumours	0	1.0	1.7	2.8
Abortion	0	1.0	1.6	2.6

In this study, the prevalence of gastrointestinal parasites in Boer goats of different age groups was found higher in adults (36%) than kids (30%). The higher prevalence in adults correlates with the previous report made by MINAGRI (2017) in which the prevalence was found to be 64.02% and 45-28% in local adults' goats and kids respectively. Our findings also agree with the report from South Africa, Gambia and semi-arid part of Kenya that reported higher prevalence rate in adult goats compared to the one in kids (Gamble et al., 2007).

Table 2: Prevalence of GIT parasites and ticks in Boer goats at Bugenyuzi Agriculture and Livestock Research Centre

Health problems	Female (N=47)	Male (N= 60)	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 & Hyaloma	5	0	5	2	3	5

N'= Total number of Boer goats examined

On the other hand, the present findings do not agree with the ones reported by Gamble and Zajac (1992) and by Caldilz (1996) and his colleagues who found that younger goats were more susceptible to internal parasitic infestation than adult goats which are older than one year. The higher susceptibility of younger goats in previous reports may be due to the fact that adult animals may acquire immunity to parasites through frequent challenges and expel the ingested parasite before they establish infestation. In this study, based on the sex 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 in males.

It was coincided with the findings of Sissay (2007) which revealed that 84.34% females were infested against 67.8% males and those of Mohamed (2008) who reported that 67.03% of female goats were infected against 45.28% male goats. With regard to ticks, *Amblyomma* and *Hyalomma* species were observed merely which confirmed previous report by Seyoum (2005) who reported the prevalence of *Ablyomma* and *Hyalomma* to be 59.5% and 34.5%, respectively.

Secondary DataAnalysis

According to results of secondary data analysis on the health problems of Boer goats, 42.2% of them were found to be affected by either one or more of health problems. Respiratory problems, GIT parasites, local abscesses, diarrhoea and orf were found to be the main diseases affecting Boer goats at Bugenyuzi Agriculture and Livestock Research Centre.

The prevalence of ticks in female and male Boer goats was 12.8% and 23.1% respectively showing no difference in tick infestation within the two sex groups. On the contrary, a remarkable difference was recorded in the prevalence of ticks in relation to the different age groups of Boer goats in which adults were less affected (6%) than kids (60%).

In the current study, goats are reared separately from other domestic animals and they are subjected to better management practices. This was in agreement with the previous reports in different areas that suggested that keeping different animals together could be the cause for increased degree of pasture contamination leading to higher prevalence of infections and parasitic infestations (Caldilz et al., 1996).

Conclusion

The relative prevalence of diseases in Boer goat crosses was found to have an overall percentage of 53.3. GIT parasites, Keratoconjuctivitis, ticks, respiratory problems and local abscesses were identified as major health issues with respective prevalence accounting for 35.0, 20.0, 15.0, 1107, and 10% at Bugenyuzi Livestock Research Centre.

The laboratory analysis revealed that *Hyalomma* and *Amblyomma* are the main tick genera identified on Boer goats and the prevalence of GIT parasites in female goats (40,4%) was found higher than in male goats (15.4%).

Goat rearing requires better management practices and has to be kept separately from other domestic animals given that keeping different animals together could be the cause for increased degree of pasture contamination leading to higher prevalence of infections and parasitic infestations.

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