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Participatory Epidemiological Study of Goat Diseases\Disorders in Benadir Region, Somalia

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Abstract: *Goats rearing was an integral part of the farming system and contribute livelihood mainly for the pastoral and agropastoral communities in Somalia, This study was conducted on a Participatory epidemiological study of goat diseases and disorders in five districts in the Benadir region with a period of May 2019 to February 2020. A total 100 questionnaire was conducted to goat farmers regarding health and management was administered and each diseased throughout generally and physically examined purposively. The majority of the smallholder flocks (62%) practiced semi-intensive management and (79%) were affected the cases observed were ectoparasites (34%), pneumonia (20%), diarrhea (20%), laminitis (18%), mastitis (13%), fever (6%), anemia (6%), while skin disease, vaginal prolapsed were only (2%) the prevalence of goat diseases and disorders per smallholder flocks based on districts includes (22.7%) Deyniile, (21%) Hodan, (20%) Dharkenley, (18.9%) Haleiwa, while (16.4%) were Yaqqshiid. So the relationship between the presences of disease in the smallholder flocks in the study area and the breed types confirms to be insignificant for CHI2 (3.13) with a degree of freedom (2) and P-value 0.2). The most system affected diseases and disorders were semi-intensive (84%) while intensive were(68%). The relationship between the presence of diseases in the smallholder flocks in the study area and the management system of their animals confirms to be significant for CHI2 (3.5) with a degree of freedom (1) and p-value (<0.05) so the study was recommended maintaining good hygiene and better disease prevention practices in the flock to improve the health status of goat population.*

Keywords:*, participatory, epidemiological, disease and disorder, goat*

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I. Background:

Livestock is the backbone of the Somali economy, with about 90% employment and 60% of gross domestic product.(IGAD, 2006). Somalia is located in east Africa, especially the horn of Africa, and covers approximately 637,660 square kilometers (FAOSTAT 2012). In 2010, a rural area had a human population of 6.9 million (63%) of the people located in rural areas (FAOSTAT 2012). The people of Somalia are mainly livestock keepers and up to 65% of the population are engaged in the livestock sector (FAOSomalia 2015).

There are two types of livestock production systems in Somalia including a pastoralist and agro-pastoral production system (Knips 2004; ADB 2010). About domesticated livestock including camel, cattle, sheep, and goats, statistically was estimated;- 7.1 million camel, 4.9 million cattle, 12.3 million sheep and 11.6 million goats, at for camel, for cattle, for sheep, and for goat (FAOSTAT 2012). In the country, there was to main types of the aproduction system is the pastoral and agropastoral production systems are found throughout the country, but with a higher concentration of pastoralists in the north and central regions, and mixed pastoralists and agropastoralists in the southern region. Seasonally pastoral community and their animals migrate in search of pasture and water is common. Livestock productivity in Somalia can improve to develop good farming practices (Knips 2004, ADB 2010).

The goats found in Somalia including; the Long-eared Somali goat, the Short-eared Somali goat, and to a lesser extent, the Somali Arab goat. The Long-eared Somalian goat is thought to be a descendent of the Somali Arab goats, which were introduced from Arabia (FARM-Africa 1996). There are more advantages to keeping sheep and goats rather than large ruminants. Among these are low cost, little feed requirement, manageable quantities of products, low risk of a total loss, high reproductive rate, and so on (Devendra and Burns, 1983).

In tropical areas livestock, health problems are high due to environmental factors like high temperature, humidity, the topographical structure of sloppy areas exposed to flood, stress factors, and drought. This is common in these areas as a result of limited feed availability and low vegetation coverage with weak animal health services (Assegid, W 2000).

As goat diseases are very much important diseases in the aspect of Somalia, it does not only affect the production performance of animals but also affect the national economy so the present study focuses on the participatory epidemiological study of goat diseases in Mogadishu Somalia. According to this study participatory epidemiological study of disease and disorder in Benadir region of Somalia but there was no written document regarding this study so this study was carried out to cross-sectionally major goat disease through statically Benadir region.

II. Materials and Methods:

Research area

The study was conducted selected districts in Benadir region Somalia purposively, this region consists of 18 districts, it lies between latitude 2°2′59″N and longitude 45°15′44″E, their population was estimated 2.3 million, bordering with lower Shebelle in the west, Indian Ocean in the south and middle Shebelle in the north and the east. Although by far the smallest administrative region in Somalia, it has the largest population estimated to be about 2.3 million and covers an area approximately 96,878 km (Wikipedia, 2020). There is no written document regarding animal population in this region.

Research Population and period

The study was conducting totally100 small holders flock, local breeds of goats selected purposively with a period of May 2019 to February 2020 which was observed selected districts in Benadir region Somalia with regard to districts, number of animals, breed, and sex. In this case, animals were contributed some nutritional supplement and usually reared as indoor system.

Research tool

The study was carried out questionnaires and each goat was physically examined for presence of skin diseases (e.g. mange, orf and other dermatitides), presence of external parasites, hoof problems, respiratory conditions, abscesses, heart rate, and any other clinical conditions.

Data gathering procedure

From May until February 2020 a structured questionnaire with open-ended and closed questions was used for face-to-face interviews of 100 smallholder flocks.

III. Data analysis:

All responses from all participants were collected and checked then analyzed trough using the Statistical Package for Social Scientists (SPSS version).

IV. Results:

Introduction

In this chapter the researcher is conducted the results found from the study data and information that has presented the previous chapters, respondents views of the questionnaires was presented in tabular presentation. And also this chapter discussed about the objectives of the research which is "to investigate the prevalence of goat diseases\disorders in Benadir region." That based on the results and facts from the data analysis.

Table 1: Management of the small holder flocks

Variables	Variables	Percentage (%)
hygienic condition	Good	14.0
	Moderate	40.0
	Poor	46.0
Cleaning of feeding utensils and water trough	Yes	17.0
	No	83.0
Days you cleaning the bedding of the animal	Daily	14.0
	3 days interval	40.0
	7 days interval	26.0

	Others	20.0
Types of feed	Green grass roughages	46.0
	concentrates and green grass roughages	28.0
	kitchen scraps and green grass roughages	20.0
	dry roughages	6.0

4.1 Hygienic conditions of the farm

Data table 4.1 shows that the majority of the farms (46%) were poor hygienic condition and (40%) of the farms were moderate hygienic condition and finally only (14%) of the farms were good hygienic condition. This study has shown that most farms observed have not been cleaned as it deserved.

4.2 Cleaning feeding utensils and water trough regularly

Data in the above table 4.1 shows that the majority of the farmers (83%) did not clean feeding utensils and water trough regularly while (17%) of the farmers cleaned.

4.3 Days you cleaning the bedding of the animal

In this study indicated that the most small holder flocks (36%) clean the bedding once in every week, (30%) clean the bedding once in every three days while (20%) of the small holder flocks clean the bedding other intservals and finally only (14%) clean the bedding daily as shown in the table 4.1.

4.4 Type of Feed they use

In the above table 4.1 shows that the most of small holder famers (46%) use green grass roughages while (28%), (20%) use combination of concentrates and green grass roughages and combination of kitchen scraps and green grass roughages respectively and finally (6%) use dry roughages.

TABLE 4.2 Housing management and diseases control information of the respondents

Variables	Variables	Percentage (%)
Type of management	Intensive	38.0
	Semi-intensive	62.0
Ventilation	Good	18.0
	Moderate	29.0
	Poor	53.0
Goats kept at night	In the goat house	85.0
	On the verandah	3.0
	Other places	12.0
Before introducing into the herd	Keep them in isolation for at least two weeks	20.0
	None	80.0
Vaccination	Yes	63.0
	No	37.0
Treatment Medicine	Yes	92.0
	No	08.0

4.5 Housing management and ventilation

In this study indicated that the most of the small holder flocks (62%) practiced semi-intensive while (38%) of the small holder flocks practiced intensive housing system. Ventilation is an important aspect of goat housing particularly closed housing in the above data 4.2 describes (53%) goat houses were poor airflow in the house While (29%) of the goat house were moderate and finally (14%) of the goat houses were good ventilated.**4.6 Where goats kept at night?**

In the above table 4.2 describes that the most of the goats (85%) kept in house while (12%) of the goats kept other places and finally only (3%) of the goat stay on the verandah at nights. In table 4.1 presented that the majority of small holder flocks (80%) didn't quarantine newly introduced goat at least two weeks and minorities of the small holder flocks (20%) did.

4.7 Uses of treatment and vaccination

In this study most of the respondent (92%) gives treatment for their patient goats while other (8%) does not as shown in table 4.2. The data in table 4.2 indicates that most of respondent (63%) vaccinated for some selected diseases in their farms and the (37%) of the respondents did not.

TABLE 4.3 goat breeds and herd composition

Breed	Total	Percent (%)
Somali long eared breed	41	41.0
Somali Arab breed	36	36.0
Mixed breed	23	23.0

Total	100	100.0

Herd composition		
Females	661	61.0
Males	177	16.0
Kids	280	26.0
Total	1068	100.0

4.8 Breed

The date in the table 4.7 show that the most of the small holder flocks (41%) had Somali long eared breed, (36%) of small holder flocks had Somali Arab breed while only (23%) of small holder flocks had mixed breeds.

4.9 Herd composition

The data in table above shows the herd composition of the farms surveyed, (% 61) were does, (16%) bucks, and (26%) were kids.

TABLE 4.4: Overall prevalence of goat diseases and disorders in the study

Cases affected	%
Yes	79.0
No	21.0
Total	100.0

4.10 Overall prevalence of goat diseases and disorders

In the above table 4.4 the majority of the farms (79%) were case affected while only (21%) of the farms were no cases complain.

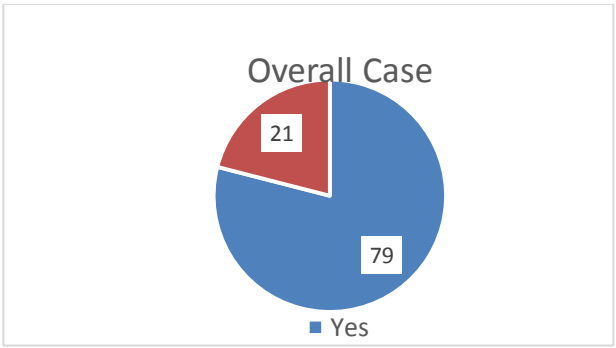

Figure 4.4 overall prevalence of goat diseases and disorders

TABLE 4.5 Prevalence of goat diseases and disorders

Diseases and disorders	**Frequency**
Pneumonia	7
Ectopaarsite	16
Diarrhea	9
Mastitis	6
Fever	2
Anemia	3
Laminitis	12
Ectoparasite + pneumonia	5
Ectoparasite + diarrhea	4
Ectoparasite + anemia	1
Vaginal prolapse+ skin disease	2
Diarrhea+ ectoparasite+ mastitis	1
Pneumonia +fever	2
Pneumonia+ mastitis	2
Ectoparasite + mastitis	2
Laminitis + ectoparasite	3
Ectoparasite+Pneumonia+diarrhea	2
Total	**79**

4.11 Prevalence of goat diseases and disorders

In total 9 major diseases and disorders were recorded among hundred small holder flocks of goat examined during the period of the study and the prevalence of disease and disorders are ectoparasites (34%), pneumonia (20%), diarrhea (20%), laminitis (18%), mastitis (13%), fever (6%), anemia (6%), while skin disease,vaginal prolapsed were only (2%) each as shown in the above table 4.5.

Table 4.6 prevalence of goat diseases and disorders per smallholder flocks based on districts

Districts	Number of examined	Number of positive	Percentage %
Dharkenley	21	16	20
Hodan	20	17	21.5
Yaaqshiid	19	13	16.4
Heliwa	18	15	18.9
Deyniile	22	18	22.7
Total	100	79	100

4.12 Prevalence of goat diseases and disorders per smallholder flocks based on districts

The data in above table 4.15 describes the prevalence of goat diseases and disorders per smallholder flocks based on districts and the majority were (22.7%) Deyniile, (21%) Hodan, (20%) DHarkenley, (18.9%) Heliwa, while only (16.4%) were Yaqqshiid.

Table 4.7 Relationship between disease occurrence and breed

Breed	NO. EXAMINED	NO. POSITIVE	%	CHI2	P-VAUE
SOMALI TYPE	34	25	73	3.13	0.2
ARAB TYPE	42	32	76		
MIXED BREED	24	22	91		

4.13 Relationship between disease occurrence and breed

As shown in the above table 4.5 the most breed affected diseases and disorders were mixed breeds (91%), flowed by Arab type (76%), while only (73%) were Somali breeds. So the relationship between presences of disease in the small holder flocks in the study area and the breed of their animals confirms to be insignificant for CHI2 (3.13) with degree of freedom (2) and P-VALUE O.2).

Table 4.8 Relationship between disease occurrence and management

MANAGEMENT	Number Examined	Number of Positive	Percentage (%)	CHI2	P-value
Semi-Intensive	65	55	84	3.5	0.05
Intensive	35	24	68		

4.14 Relationship between disease occurrence and management

As shown in the above table 4.6 the most system affected diseases and disorders were semi-intensive (84%) while intensive were(68%).So the relationship between presences of disease in the small holder flocks in the study area and the management system of their animals confirms to be significant for CHI2 (3.5) with degree of freedom (1) and P-VALUE (<0.05).

4.15 Discussion of the result

This study was conducted in different districts in Benadir region, Somalia to determine the epidemiological diseases and disorders through questionnaire, present study shows that most goat small holder flocks practiced 62% was semi-intensive farming system while 38% intensive farming system, Similarly Yusuf *et al* (2018) shows that most goat management system in Nigeria was semi-intensive 44% and intensive or stall feeding is 38%, such minor differences may arise from differences in locations, breed, and climate. Overall prevalence of diseases\disorder was (79%) in selected districts in Benadir region. In a (34%) was ectoparasite prevalence similarly Nateneal *et al* (2015) who have reported the prevalence of ectoparasite (37%) in east shawa of Oramia Ethiopia. Another than (20%) pneumonia, This is closer to the study of Mekibib *et al* (2019) which indicated the prevalence of pneumonia (17.11%) in Ethiopia. This present study also indicates that the case of diarrhea was (20%), Similar report Omoike (2006) which described the prevelance of diarrhea on goat (20%) in

Nigeria. In (12%) of the stud was lameness case, Paul et *al* (2001) examined similar study of lameness was (12%). D. In a present study fever was showing (6%) Inaccording to anemia study shows that anemia was (6%), Adehanom *et al* (2015) which shows that the prevalence of anemia in Ethiopia was (8.5%). There none sifnificant variation ($p>0.05$) with respect to the breeds of Somali goat. Also ($p<0.05$) none significant variation between semi intensive and intensive production system.

V. Conclusion:

The researcher collected primary data using questionnaire as a research instrument followed by clinical investigation of goat at farm level; a sample of 100 small holders flock in Benadir region. Descriptive and co relational designs were used. The shape of the questionnaire in the demographic section is looked upon in terms of :(name, district, etc) and Management system information sections; including hygienic system, Dietary, water history. Housing system information and livestock herd size, breed, and sex. As well as detailed animal health care practices including any case affected the farm: And if treatment and vaccination used for them. Analysis of data in this study was done concurrently with data collection. After data collection the questionnaires of respondents were sorted out accordingly; responses were verified, coded, categorized and entered into the computer using statistical package for Social Sciences (SPSS) version 20.0 software. In this section the researcher suggested some recommendations:

- The researchers recommended maintaining good hygiene and sanitation practices in the flock to improve health status of goat population.
- Public awareness programs for livestock owners to keep goats in intensive housing system than other housing systems with regard to the occurrence of diseases.
- In this study, it was based on general investigation of goat diseases\disorders in Benadir region so it is recommended to make further research on to controlling prevailing disease to improve the health status of goat population.
- It should provide advice to the farmers to use quarantine and effective Biosecurity during disease outbreaks.
- The researchers recommended to ensure adequate ventilation of goat house, it is important that the building is designed to remove microorganisms, dust and gases.
- Awareness creation for local goat farmers about the control of ectoparasites is essential.
- Further detail study should be done to specify the external parasites on goat in the study.

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