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Original Research

A Retrospective Study of Major Livestock Diseases in Wombera District, Metekel Zone, Benishangul Gumuz Region, Western Ethiopia

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Abstract

From July 2018 to June 2023, researchers in the Wombera district combed through medical health post and veterinary information spanning five years. To find out how diseases were spread among animals, places, and times, a descriptive frequency statistic was utilized. Eleven hundred fifty-eight cattle were evaluated during this time. The 1158 animals that have been identified thus far consist of 847 cattle (73%), 151 sheep (13%), 53 goats (4.6%), 59 equines (5.1%), and 48 chickens (4.14%). The most common problems in these animals were caused by endoparasites (33%), bacteria (29.9%), ectoparasites (16.1%), protozoa (12.4%), and viral infections (5.3%). Endoparasites(6.22%), bacterial infections(4.1%), ectoparasites(1.98%), and viral infections (1.13%), according to the prevalence of diseases in cattle. Between the two seasons, summer accounted for 406 cases (or 35% of the total) and spring for 266 cases (23%). There were fewer cases in the winter (247) and the fall (21%), and fewer animals overall. Parasitic, bacterial, protozoan, and viral diseases were the most frequently reported problems affecting cattle in the survey. That being said, we need to get down to business and make sure that the right procedures and management of animal health are in place.

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INTRODUCTION

Ethiopia is the world's tenth most populated livestock country, with 70 million cattle heads, 42 million sheep, 52 million goats, 13 million equines, 8 million camels, and 56 million poultry (CSA, 2021). Sources of animal protein, energy for growing crops, transportation, export goods, manure for home and farm energy, safety in the event of crop failure, and a way to build wealth are all provided by livestock. The industry provided 20% of the country's foreign exchange revenues, up to 40% of the agricultural GDP, and about 20% of the total GDP (Mekuriaw, 2021).

A disease's effect on animal production might be direct or indirect, and this can have

an impact on trade restrictions, food safety, rural development, the environment, and farmers' livelihoods. Animal diseases are abundant in Ethiopia's agroecological zones and negatively impact the nation's livestock industry and economy directly and indirectly (Hordofa et al., 2021). The primary consequences of the diseases include death, low productivity, lower-quality milk, and meat products, diminished drought resistance, and a higher burden of disease transmission among humans. Ethiopia has the highest health burden from zoonotic diseases. Thus, one of the most effective preventative strategies currently available and applied to humans and animals is instantaneous animal drift, which helps alleviate the expanding patterns of infectious disease hazards to livestock health and human health concerns (Oyda et al., 2020).

Raising livestock is one way for African communities to improve their economic status, particularly in rural areas. Muddy flood-prone areas, which facilitate the spread of soil-borne infections, pressures, drought, and high temperatures and humidity, all contribute to the high occurrence of livestock health issues in tropical climates. This results in diminished foliage coverage and limited feed availability. The other reason identified is a shortage of animal health services (Abdeta et al., 2016).

There was not any research done on the impact of livestock diseases in the study area, even though they are becoming a major socioeconomic concern and problem. Consequently, the study's goal was to outline the incidence of diseases in the study area as well as the distribution of the primary livestock diseases by animal, place, and period.

METHODOLOGY

Study Area

The research was done from May to August 2023 in the Wombera area, Metekel Zone, Benishangul Gumuz, which is around 610 kilometers from Assosa, the region's capital. It lies between longitude 35°24'59.99" East and latitude 10°29'59.99" North.

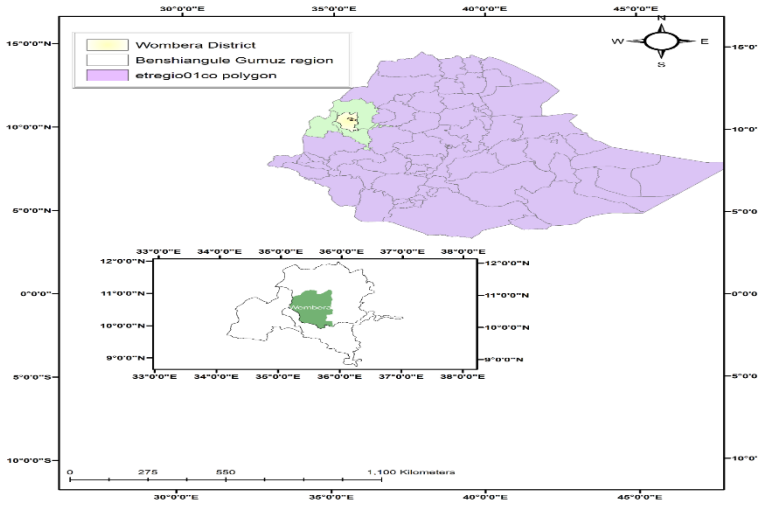

Figure 1. *Map of the study area where the studies were conducted*

The settlement of Debere Zeit is the district town. It is situated within three agro-climatic zones: dega 17%, woyena dega 11%, and kola 72%, according to Ethiopia's simple agro-climatic categorization. The district covers approximately 7464 square km in total. The district experiences two distinct seasons of rainfall: the major summer rainy season, which peaks in July (June to August), and the short summer rainy season, which runs from February to April. The amount of rainfall is 900 mm to 1740 mm. 18°c is the average temperature (NMSA, 2021). It is estimated that there are 83,849 cattle, 60,497 sheep, 10,253 goats, 15,521 horses, and 71,434 chickens in the district. In the study area, there are thirty animal health centers, one veterinary clinic, and thirty peasant associations (WWAO, 2023).

Study population

The current study's target population comprises the whole livestock population of the Wombera district. The study covers the livestock populations of six peasant organizations that were chosen as study subjects. The sampling population consists of all livestock species that have visited a designated veterinary clinic or Keble animal health center with various health issues. The study animals were classified as young (<2 years), adults (2–3 years), or old (4–10 years) based on their history as recorded in the case book (Jibat *et al*., 2016).

Study Design and Study Period

The most frequent animal diseases in the research areas were identified using a retrospective study approach. To accomplish this, case books of registered livestock species from 2018 to 2023 were used to gather retrospective data from one veterinary clinic and five Keble animal health posts.

Sampling Procedure and Sample Size

This study covers five Keble animal health stations and one veterinary clinic. The sampling approach used is non-probability sampling. Keble's was specifically picked because there was verified secondary data available. The sample size comprises all clinical information from livestock species that visited health posts and clinics. During the retrospective investigation, 1158 clinical cases were recorded, comprising the overall sample collected from six animal health stations.

Data Collection

Clinical information on disease cases examined between 2018 and 2023 was gathered from Keble Health Post-Case Book Registration and the chosen veterinary facility. Datasheets were created and completed in Microsoft Excel to collect retrospective data.

Data Analysis

An investigation has been carried out at five animal health centers throughout the town and the veterinary facility in the district town. The source was five years of important livestock disease records from Keble animal health stations and clinics. A Microsoft Excel spreadsheet was used to enter, store, and code the recorded data. The top diseases among animals, places, time, and livestock species registered annually

were determined using descriptive statistics. The percentage of main livestock diseases was used to express the findings. On the Excel sheet, a pivot table was used to analyze the data.

RESULTS AND DISCUSSION

Overall, 1158 livestock cases were examined in the Wombera district veterinary clinic and health posts between July 2018 and June 2023, according to the results of this retrospective investigation (Table 1).

Table 1

Prevalence of livestock examined in veterinary clinics and health posts

Species	Number	Prevalence (%)
Bovine	847	73%
Ovine	151	13%
Caprine	53	4.6%
Equine	59	5.1%
Poultry	48	4.14%
Total	1158	100%

Endoparasites accounted for the highest percentage 33% of the 1158 livestock cases examined. Bacterial 29.9%, ectoparasites 16.1%, protozoan 12.4%, and viral 5.3% were the most prevalent, while non-infectious 1.81%, fungal 0.8%, reproductive 0.52%, and other 0.35% were the least common examined (Tables 2 and 3).

Table 2

Prevalence of major livestock health disorders identified in the study area

Diseases	*Bovine* %	*Ovine* %	*Caprine* %	*Equine* %	*Poultry* %	Total %
Endoparasites	257(22.2)	72(6.22)	24(2.07)	29(2.5)	0	382(33)
Ectoparasites	155(13.4)	23(1.98)	5(0.43)	3(0.26)	0	186(16.1)
Bacterial infections	277(23.92)	47(4.1)	18(1.55)	4(0.35)	0	346(29.9)
Protozoan infections	118(10.2)	0	1(0.09)	9(0.8)	15(1.3)	143(12.4)
Viral infections	13(1.13)	6(0.51)	5(0.44)	4(0.35)	33(2.9)	61(5.3)
Fungal infections	9(0.8)	0	0	0	0	9(0.8)
Reproductive	6(0.52)	0	0	0	0	6(0.52)
Non-infectious	12(1.04)	3(0.26)	0	6(0.52)	0	21(1.81)
Others	0	0	0	4(0.35)	0	4(0.35)
Total	847(73)	151(13)	53(4.6)	59(5.1)	48(4.14)	1158(100)

Table 3

Livestock disease examined at Veterinary clinic and health posts from 2018-2023

Classification	Animal disease identified	Frequency
Parasitic	Internal parasite infection	382
	External parasitic infection	186
Bacterial	Bovine pasteurellosis	108
	Blackleg	44
	Salmonellosis	30
	Pneumonia	42
	Ovine pasteurellosis	25
	Mastitis	36
	Brucellosis	13
	Contagious Bovine pleuropneumonia (CBPP)	19
	Actinomycosis	4
	Bovine tuberculosis	2
	Contagious Caprine Pleuropneumonia (CCPP)	3
	Strangle	4
	Actinobacillosis	3
	Conjunctivitis	5
	Dermatophilosis	8
Protozoan	Trypanosomosis	93
	Babesiosis	29
	Coccidiosis	21
Viral	Bluetongue	3
	Lumpy skin disease (LSD)	13
	Newcastle disease (NCD)	34
	Rabies	2
	Peste des petits ruminants (PPR)	3
	Sheep and goat pox	4
	Epizootic lymphangitis	2
Fungal	Dermatophytosis	9
Reproductive	Uterine prolapse	4
	Retained placenta	2
Non-infectious	Bloating	12
	Grain overload	9
Others	Wound	3
	Lameness	1
Total		1158

Each event tended to decrease over time when the five-year temporal pattern of the most common health issues was examined. The year 2019 had the most cases reported, while 2023 had the lowest number of cases, shown below in a line graph (Figure 2).

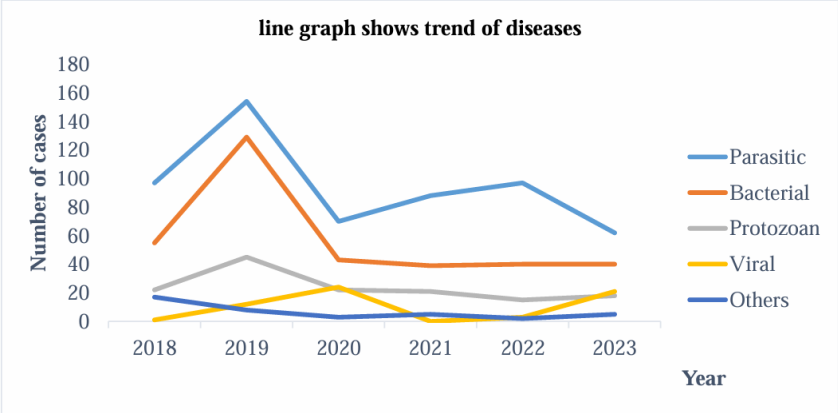

Figure 2. *Temporal distribution of livestock health disorders examined*

In twelve months covering 2018 to 2023, 1158 clinical cases were examined. As shown in Figure (3), the greater cases were reported from May to July, peaked in July, and gradually decreased from August to December.

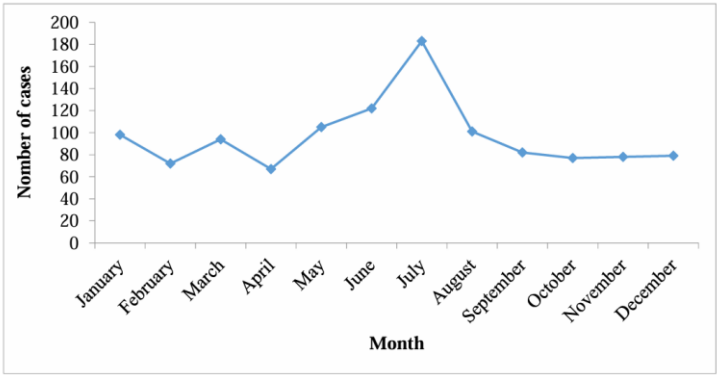

Figure 3. *Temporal distribution of livestock cases within the month*

The temporal distribution of livestock diseases is more common in the summer period than in other seasons in the study area (Figure 4).

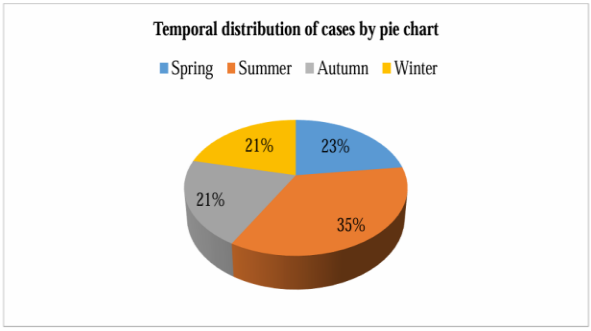

Figure 4. *Temporal distribution of cases by season*

The main animal health issues are related to the geographic dispersion across the previous five years. The bar graph (Figure 5) displays the number of cases reported to the six animal health centers.

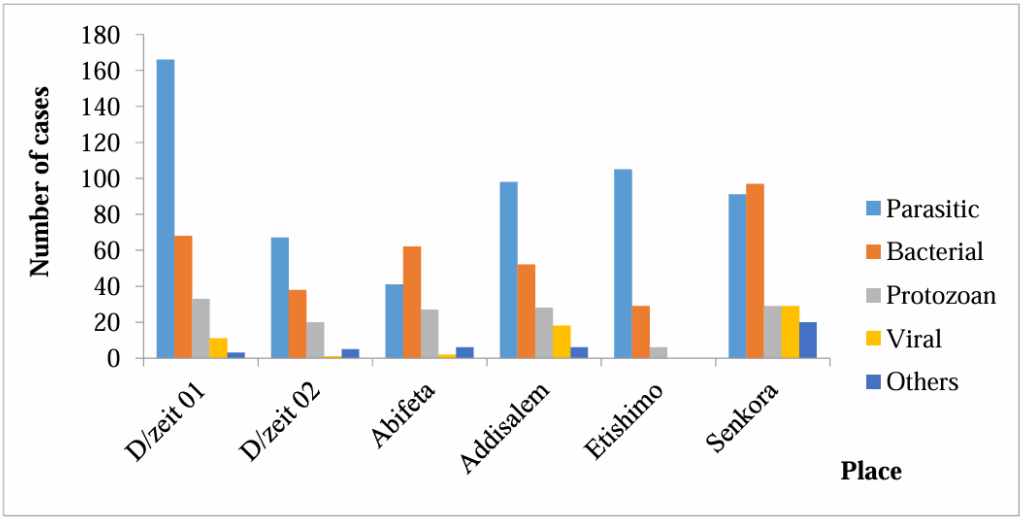

Figure 5. *Spatial distribution of livestock health problems examined in the study site*

Regarding examination and treatment value across the animal species shown in the bar graph (Figure 6), the health service received the most reports from sheep and cattle and the fewest from horses, goats, and chickens.

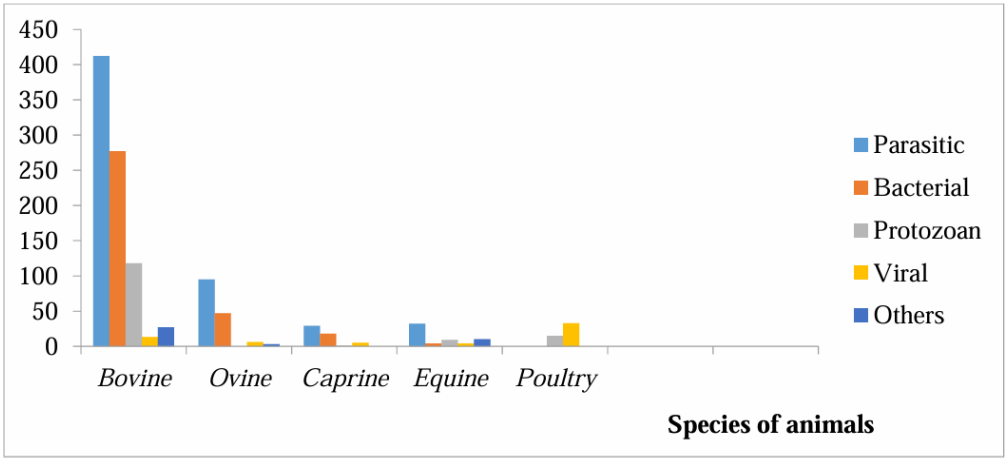

Figure 6. *Distribution of disease by animal species*

Retrospective analysis showed that the highest number of instances were in cattle followed sheep, and the lowest number in equines, goats, and chickens. The most probable explanation for this variation could be the stronger disease immunity of goats and equines compared to sheep and cattle. It is reported that in contrast to cattle and sheep, equines and goats exhibit strong resistance to common diseases (Wahab *et*

al., 2019). It may also mean that a greater number of smallholder farmers are raising cattle and sheep than other livestock, presumably as a result of the strong demand for these animals in the market, the cultural makeup of our country, and the agroecological preference for cattle and sheep for highland over lowland. This result is consistent with research on bacterial and viral infections in livestock conducted in South Africa, where cattle and sheep cases outnumbered goats (Jaja *et al*., 2022). The chickens visited the veterinary clinic, and the health posts for diagnosis were few. This is due to a lack of awareness about chicken management. A small-scale scavenging production system is practiced by households located in remote villages, making it difficult to control chickens for veterinary services. This is similar to what was reported in earlier findings in Uganda (Byaruhanga *et al*., 2017).

Upon conducting a season-by-season analysis of the total data, summer accounted for 35%, while spring brought 23%. Winter 21% and fall 21% had the lowest number of cases (Figure 4). The present study indicates livestock disease was more prevalent in the summer period. This finding agrees with the previous report that in the Chinaksen district, East Hararge Zone, Oromia region, there were more livestock cases over the summer (Assefa et al., 2024).Seasonal shifts have been linked to changes in stress, circumstances, immunity in the host, and the number of vectors during different seasons. These factors may affect the probability of contracting a disease during specific times of the year. Seasonal changes are recognized to have a direct correlation with infectious disease outbreaks. Weather parameters such as temperature, relative humidity, and rainfall have a favorable correlation with the occurrence of these diseases (Manyeki *et al*., 2022).

According to the current study, the most common livestock disease affecting both large and small ruminants is parasitic infection (both internal and external parasites). They impact various animal populations, physical areas, and agricultural practices. This is in line with the report of Nuguse and Gemechu (2023; Hordofa and Geleto, 2022). They have mixed effects, lowering animal output levels and raising expenses. Although parasite infections have a wide range of consequences, it seems that livestock output is primarily affected by them (Majumder *et al*., 2022).

Bacterial infections, mainly bovine pasteurellosis, blackleg, salmonellosis, pneumonia, ovine pasteurellosis, mastitis, and brucellosis, were the most prevalent illnesses in the study area (Table 3). These conditions were most commonly examined in both large and small ruminants. The most prevalent disease seen in cattle was pasteurellosis, followed by blackleg. This lethal infection can be caused by several factors, including the period of year, harsh conditions, and animal migrations in search of food and water. This notion is consistent with that of Zakaria *et al*. (2019). Worldwide, brucellosis is a serious public health concern. The illness results in production losses and creates a barrier to commerce. In rural areas, livestock can travel over several kilometers while grazing on shared pastures. Since calving is not confined to a particular location, like an

enclosed corral, a diseased animal could potentially distribute the contamination over a wide region. Therefore, this may serve as a source of illness for additional livestock populations that share the same grazing (Aruho *et al*., 2021).

Trypanosomosis, babesiosis, and coccidiosis were protozoan infections found to be the other most common diseases of livestock in the study area (Table 3). This finding is compatible with Aliman *et al*. (2022). Tsetse-transmitted trypanosomosis is turning into a major threat to livestock production in general and agricultural activities in particular in the Northwestern tsetse belt areas of Ethiopia. This can be attributed to the region's placement within the tsetse belt of the nation (Efa, 2021). Conversely, the most common cattle disease identified was babesiosis, a hemoparasite spread by ticks and caused by various species of Babesia. The high prevalence of babesiosis may be related to the difficulties in controlling tick populations effectively as a result of the evolution of drug resistance to agents and acaricides (Vudriko *et al*., 2016). Viral infections like, bluetongue in goats, lumpy skin in cattle, Newcastle in chickens, and rabies in cattle and equines were recorded from the present study area (Table 3). According to previous publications (Nakayima *et al*., 2016), Newcastle disease was likewise shown to be the most common disease affecting poultry. For both large and small ruminants, bluetongue is a vector-borne illness that has significant economic implications (Sohail *et al*., 2019). Sheep are the primary host of bluetongue, with subclinical infections occurring primarily in goats and cattle (Van Den Bergh *et al*., 2018). There is virtually little data on the epidemiology of livestock rabies. There is still a shortage of rabies case surveillance and timely reporting. The main factor contributing to the spread of rabies is frequently canine rabies (Weyer *et al*., 2020).

In this study, non-infectious disorders such as bloating, reproductive-related problems, fungal infections, and others were also less common disease conditions. This observation may indicate that the proprietors have been using herbal medicine from the area to treat these instances (Alekish and Ismail, 2022).

CONCLUSIONS

This study discovered that parasitic, bacterial, protozoan, and viral infections are the most prevalent primary diseases in livestock observed during the study period. The infection prevalence reported in the current study presents an obstacle to profitable livestock farming and the health of the people in the study area. The data gathered from this study could provide useful information for developing better preventive measures or methods to combat these frequently observed disorders. Based on the aforementioned conclusion, the following recommendations are made:

i. *Veterinarians at the district level require laboratory-based examination for every infection rather than a tentative diagnosis.*
ii. *Regular vaccination against viral diseases such as PPR, rabies, and Newcastle is recommended.*

iii. *Use strategic deworming for internal parasites and acaricide spraying to eliminate external parasites.*
iv. *Further research is needed to confirm the recorded disease-causing agents in the study area.*

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DECLARATION

The authors declare that they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

All data are available from the corresponding author upon request.

REFERENCES

Abdeta, D., Zenebe, T., Fikirte, L., Negessu, D., & Hirpa, E. (2016). Retrospective survey on major cattle diseases in Guto Gida district, Eastern Wollega, Nekemte, Ethiopia. *Science, Technology and Arts Research Journal 4*(4), 120. http://dx.doi.org/10.4314/star.v4i4.17

Alekish, M. O., & Ismail, Z. B. (2022). Common diseases of cattle in Jordan: A retrospective study (2015–2021). *Veterinary World*, 2910–2916. https://doi.org/10.14202/vetworld.2022.2910-2916

Aruho, R., MacLeod, E. T., Manirakiza, L., & Rwego, I. B. (2021). A serological survey of brucellosis in wildlife in four major National Parks of Uganda. *BMC Veterinary Research*, *17*(1). https://doi.org/10.1186/s12917-021-02782-4

Assefa, M., Jima, C., & Musa, K. (2024). Retrospective analysis of major reportable cattle disease outbreaks from 2017 to 2023 in Chinaksen district, East Hararge Zone, Oromia, Ethiopia. *Journal of Research in Veterinary Sciences*, *2*(2). https://doi.org/10.5455/jrvs.20240111060012

Byaruhanga, J., Tayebwa, D. S., Eneku, W., Afayoa, M., Mutebi, F., Ndyanabo, S., Kakooza, S., Okwee-Acai, J., Tweyongyere, R., Wampande, E. M., & Vudriko, P. (2017). Retrospective study on cattle and poultry diseases in Uganda. *International Journal of Veterinary Sciences and Medicine*, *5*(2), 168–174. https://doi.org/10.1016/j.ijvsm.2017.07.001

CSA. (2021). Central Statistical Agency agricultural sample survey the federal democratic republic of Ethiopia. Report on crop and livestock product utilization, Addis Ababa. Volume *2*:592.

Efa, D. A. (2021). Bovine trypanosomiasis epidemiology and tsetse fly density in Jimma Arjo district, East Wollega Zone, Oromia Regional State, Ethiopia.

Veterinary Medicine: Research and Reports, Volume 12. https://doi.org/10.2147/vmrr.s336585

Hordofa, F. D., Meseret, K., & Leta, S. (2021). Retrospective study of livestock vaccine coverage and trend in Lemu and Bilbilo District, Arsi Zone, Ethiopia. *International Journal of Veterinary Science and Research*, 144–150. https://doi.org/10.17352/ijvsr.000094

Hordofa, D., & Geleto, M. (2022). Retrospective study on major livestock disease in Lemu and Bilbilo district. *J Med Res Health Educ*, *6* (5). https://doi.org/10.36648/ipjmrhe.6.5.19

Jaja, I. F., Wanga-Ungeviwa, P., & Njoga, E. O. (2022). A retrospective report of viral and bacterial diseases in Livestock, Eastern Cape Province, South Africa. *World's Veterinary Journal*, 34–42. https://doi.org/10.54203/scil.2022.wvj5

Jibat, B.T., Abegaz, B. A., & Chibsa, T. R. (2016). Trend analysis of herd composition and its trade implication in Borena, southern pastoral area of Ethiopia. http://www.lrrd.org/lrrd25/3/beye25047.htm

Nakayima, J., Nerima, B., Sebikali, C., & Magona, J. (2016). An assessment of veterinary diagnostic services needs in Uganda. *Journal of Veterinary Medicine and Animal Health*, *8*(7), 50–55. https://doi.org/10.5897/jvmah2016.0462

Nuguse, A., & Gemechu, F. (2023). A Retrospective study on common animal diseases from 2018 to 2022 in Gida Ayana District, East Wollega Zone, Western Ethiopia. *World Journal of Medical*, *4*(2). https://doi.org /10.11648/j.wjmcr.20230402.12.

Majumder, R., Parvin, M. S., Shohana, N. N., Rony, S. A., Islam, M. A., Islam, M. T., & Rahman, A. K. M. A. (2022). Retrospective study of farm animal diseases presented Atpara Upazila Veterinary Hospital, Netrakona, Bangladesh. *J. Vet. Med*, *20*(2). https://doi.org/10.33109/bjvmj

Manyeki, J., Kidake, B., Mulei, B., & Kuria, S. (2022). Mortality in Galla Goat Production System in Southern Rangelands of Kenya: Levels and Predictors. *Journal of Agricultural Production*, *3*(2). https://doi.org/10.56430/japro.1128747

Mekuriaw, Z. (2021).Management entity. Ethiopia's livestock systems: Overview and areas of inquiry. Gainesville, FL, USA: Feed the future innovation lab for livestock systems. Pp. 1-37. LSIL _Livestock_Systems_Overview_Ethiopia_2021_08.pdf (ufl.edu)

NMSA. (2021). Monthly report on temperature and rainfall. National Meteorological Services Agency, Assosa, Ethiopia. Yearly & Monthly weather - Asosa, Ethiopia (weather-atlas.com)

Oyda, S., Abebe, R., and Megersa .B. (2020).A retrospective study on the occurrence of reportable priority cattle diseases in Southern Nations, Nationalities and Peoples' Regional State, Southern Ethiopia. *Agricultural Science*, *1*(1), 30-38. https://doi.org/10.30560/as.v1n1p30

Sohail, T., Yaqub, T., Abbas, T., Rabbani, M., Nazir, J., Maqbool, S. M., Yaqub,

S., Habib, M., Ul-Rahman, A., Mukhtar, N., Shahbaz, M., Zahoor, M., & Shabbir, M. Z. (2019). Seroprevalence of Bluetongue virus in small and large ruminants in Punjab province, Pakistan. *Acta Tropica*, *189*, 22–29. https://doi.org/10.1016/j.actatropica.2018.09.020

Van Den Bergh, C., Coetzee, P., & Venter, E. H. (2018). Reassortment of bluetongue virus vaccine serotypes in cattle. *Journal of the South African Veterinary Association*, *89*. https://doi.org/10.4102/jsava.v89i0.1649

Vudriko, P., Okwee-Acai, J., Tayebwa, D. S., Byaruhanga, J., Kakooza, S., Wampande, E., O'Mara, R. E., Muhindo, J. B., Tweyongyere, R., Owiny, D. O., Hatta, T., Tsuji, N., Umemiya-Shirafuji, R., Xu, X., Kanameda, M., Fujisaki, K., and Suzuki, H. (2016). The emergence of multi-acaricide resistant Rhipicephalus ticks and its implication on chemical tick control in Uganda. *Parasites & Vectors*, *9*(1). https://doi.org/10.1186/s13071-015-1278-3

Wahab, Y. A., Akinlabi, E. Y., & Raheem, K. (2019). A Five-Year retrospective study of small ruminant cases presented to the State Veterinary Hospital, Ibadan Nigeria. *International Journal of Environment, Agriculture and Biotechnology*, *4*(5), 1382–1386. https: //doi.org/10.22161/ijeab.45.14

Weyer, J., Msimang, V., Grobbelaar, A. A., Roux, C. L., Moolla, N., Pawęska, J. T., & Blumberg, L. (2020). Epidemiology of human rabies in South Africa, 2008 - 2018. *South African Medical Journal*, *110*(9),877.https:/doi.org/10.7196/samj. 2020.v110i9.14324

WWAO. (2023). Wombera Woreda Agricultural Office local area livestock population survey. Annual report.

Zakaria, M., Faridon, B. S., Zamri-Saad, M., & Salleh, A. (2019). A retrospective study on common health problems in ruminants. *Advances in Animal and Veterinary Sciences*, *7*(11). https://doi.org/10.17582/journal.aavs/2019/7.11.944.949