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Full Research Article

SEROPREVALENCE AND RISK FACTORS OF CONTAGIOUS BOVINE PLEUROPNEUMONIA IN HORO GUDURU WALLAGGA ZONE, WESTERN ETHIOPIA

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Abstract

Livestock diseases pose a major threat to animal health and farmer livelihoods in Ethiopia. Contagious bovine pleuropneumonia (CBPP) is a major threat. It is caused by *Mycoplasma mycoides* subsp. mycoides. This bacterial infection affects cattle and causes pneumonia. To assess the current situation, a study was conducted in Horo Guduru Wallagga, Ethiopia. The main objectives were to determine the seroprevalence of CBPP in cattle and evaluate farmer knowledge, attitudes, and practices related to the disease. Cross-sectional studies were conducted from October 2019 up to June 2020. Blood samples were collected and tested for antibodies against *M. mycoides* using a cELISA test from cattle (n = 768). Questionnaires were also administered to farmers (n = 20 households) in three districts. The seroprevalence results showed 14.3% of cattle were positive for CBPP antibodies. CBPP seroprevalence was 16.4% in Abe Dongoro, 13.6% in Hababu Guduru, and 10.8% in Guduru. The seroprevalence among the three districts surveyed did not show statistically significant differences. The majority of respondents (77%) were male and the minority (23%) were female. The farmer survey revealed knowledge gaps; only 4.5% of respondents recognized CBPP as a disease causing reduced growth and productivity. In conclusion, this study found a high CBPP seroprevalence, indicating active infection, in the cattle population sampled. Targeted education and disease control efforts are needed to curb the further spread of

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CBPP. The questionnaire results highlight the need for farmer training on CBPP risks, prevention, and treatment. Ultimately, collaborative strategies are required to safeguard animal health and livelihoods in this region.

Key Words: Bovine, Antibody, Mycoplasma, Infection

INTRODUCTION

Contagious bovine pleuropneumonia (CBPP) has been a prevalent disease worldwide. Although it had been eradicated from most continents by the mid-twentieth century, it remains one of the most severe infectious diseases affecting cattle in Africa today (World Organization for Animal Health, 2002). In Africa, the incidence of CBPP began to decline in the 1970s but resurfaced in the late 1980s and early 1990s due to limited funding for veterinary services as a result of economic and fiscal constraints (Tambi et al., 2006; Rovid, 2008). There have been significant outbreaks of CBPP in East, South, and West Africa in recent years. Reportedly, CBPP cost about $2 billion annually and affects 27 African countries (Otte et al., 2004). Between 1995 and 2002, there were 2,719 outbreaks registered in Africa. The East African nations accounted for the majority of the outbreaks, with Ethiopia and Tanzania responsible for 58% and the remaining East African countries making up 8% (Tambi et al., 2006; Alemayehu et al., 2014).

CBPP currently causes significant economic losses due to livestock sickness and death in Ethiopia, which is one of the East African nations (World Organization for Animal Health 2008). Livestock production makes a significant contribution to Ethiopia's economy, accounting for 15-17% of Gross Domestic Product (GDP), 35-49% of agricultural GDP, and 37-87% of family income (Leta and Mesele, 2014). Ethiopia has the highest burden of livestock diseases among Sub-Saharan countries, with CBPP being one of the most lethal infectious animal illnesses, resulting in 3.23 million cattle, 4.37 million sheep, and 4.90 million goat deaths in FY2014/2015 (Central Statistical Agency, 2015). CBPP was added to the list of the reportable animal diseases by the World Organization for Animal Health as this disease has a significant socioeconomic impact. Additionally, because of its severe economic consequences, it has been listed as a serious transboundary animal disease (Food and Agriculture Organization (FAO), 2002). As a result, CBPP is one of the major diseases affecting cattle in Africa (Amanfu, 2009; Marobela-Raborokgwe, 2011).

In Africa, immunization (T1/44 or T1SR) is the predominant prevention technique used against CBPP, and antibiotic therapy is the predominant treatment for sickness (World Organization for Animal Health, 2008). Recent research has shown that treating all affected animals with antibiotics can significantly reduce transmission to healthy contacts, but despite vaccination being considered a CBPP preventative strategy in Ethiopia, the disease continues to persist in many areas of the country. Cases of CBPP are rising each year. This is due to several factors. There is a lack of effective vaccines. Vaccination coverage is inconsistent and low. The cattle movement is not

well managed. There is no systematic disease monitoring. Trusted data are lacking. All these issues contribute to the ongoing spread of CBPP (Gizaw, 2004).

In the past few years, CBPP has spread to regions where it was previously eliminated (Food and Agriculture Organisation, 2002). Not only are there more cases in newly infected areas, but endemic regions are also seeing an increase in incidence. To develop effective policies, it is crucial to understand the knowledge, attitudes, perceptions, and behaviors related to disease control (Thomson, 2005; McLeod and Rushton, 2007; Heffernan, 2008). However, there is a lack of published data on CBPP seroprevalence in this particular study area and the specific districts of Abe Dongoro, Guduru, and Hababo Guduru.

Furthermore, due to unreported disease outbreaks, there is a lack of data on the seroprevalence and impact of CBPP in the region. Additionally, there is a lack of documentation regarding knowledge, attitudes, and practices related to early identification, detection, and notification of CBPP transmission, symptoms, and disease control techniques in the community. Therefore, this research aims to achieve the following objectives:

1. Determine the seroprevalence of CBPP in the study area.
2. Assess associated risk factors for CBPP.
3. Assess the knowledge, attitudes, and practices of farmers towards CBPP.

MATERIALS AND METHODS

Study Area Description

The Horro Guduru Wallagga Zone is situated in western Ethiopia. It is about 314 kilometers from the capital, Addis Ababa. It is located at an elevation of 2,430 meters above sea level. This zone has nine districts. For this research, the specific districts of Abe Dongoro, Hababo Guduru, and Guduru within the zone were selected as study sites. The Abe Dongoro district ranges in elevation from 1,600-2,300 meters above sea level, with annual temperatures fluctuating between 12°C and 32°C. Guduru District sits at 1,500-2,400 meters above sea level, where temperatures vary from 16°C to 32°C. Similarly, Hababo Guduru District has an altitude of 1,500-2,400 meters above sea level, with temperatures ranging from 16°C to 32°C. (see Figure 1).

Study Population

The study population included Horro cattle breeds of all ages and both sexes over 6 months old across the three selected districts. Only native zebu cattle were included, while any animals that were healthy or had a history of CBPP vaccination were excluded (no CBPP vaccination had occurred in these areas). Cattle ages were categorized into young (6 months to 3 years) and adult (over 3 years) based on owner-

reported information. Herd sizes ranged from 2 to 25 cattle. Cattle were grouped based on herd size into small (2-7), medium (8-14), or large (15-25) for analysis. The previous respiratory illness of each animal was classified as either present or absent. Body condition score classification follows the system described by Nicholson and Butterworth (1986) (Appendix 1).

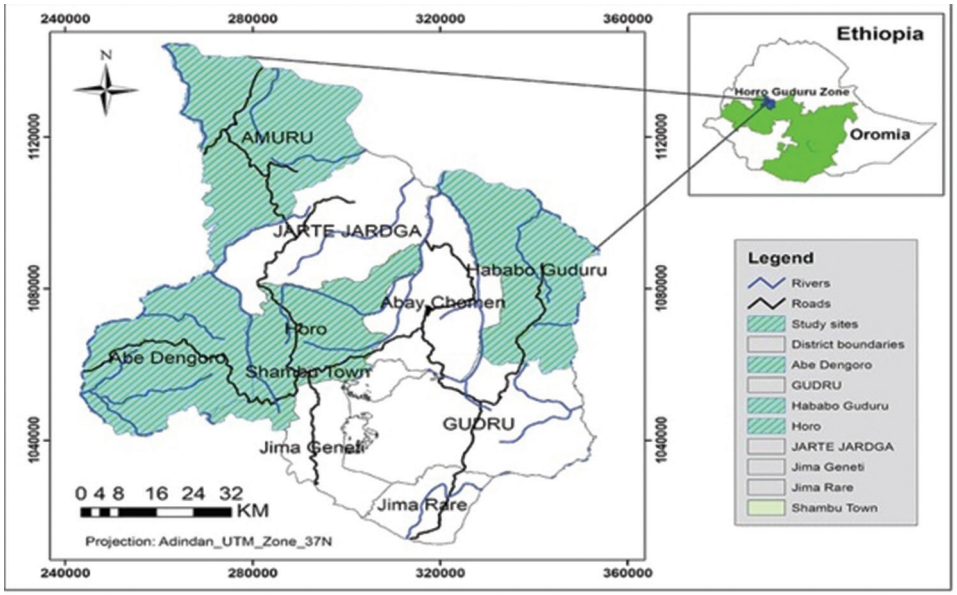

Figure 1. Map of study area, Horro Guduru Wollega Zone by districts (FEDBO, 2016)

Study Design

The cross-sectional study design and questionnaire survey were carried out from September 2019 to June 2020.

Sample Size Determination

The number of samples needed was determined based on the anticipated seroprevalence of CBPP in the area. Since the actual seroprevalence was unknown in Horo Guduru, a predicted prevalence of 50% and a desired absolute accuracy of 5% were used to calculate the sample size, as recommended by Thrusfield (1995).

The formula used for sample size calculation was:

$$n = \frac{(1.96)2\ (Pexp)(1\text{-}pexp)}{d2} = \frac{(1.96)2(0.5)(1\text{-}0.5)}{(0.05)2} = 384 \text{ x } 2 = 768$$

Where:
n = required sample size
Z = z statistic for level of confidence (1.96)
P = expected prevalence (50%)
d = desired absolute precision (5%)

To increase precision, the calculated sample size was doubled to give a total of 768 animals to be sampled.

For the questionnaire survey, the number of households needed was determined using the recommended formula by Arsham (2002). With a standard error of 5%, precision level of 0.05, and 95% confidence interval, the estimated household sample size was calculated.

$$N = \frac{0.25}{SE2} = \frac{0.25}{(0.05)2} = \frac{0.25}{0.0025} = 100$$

Where: N=sample size, SE=standard error.

To increase precision, the calculated sample size was doubled, giving a total of 200 households to be surveyed.

Sampling Techniques

The specific districts of Abe Dongoro, Guduru, and Hababo Guduru were selected based on criteria such as road access, livestock availability, and location within the zone. A simple random sampling technique was used to choose animal owners and their cattle from these districts. Nine villages with pastoral areas (PAs) were also randomly selected: Biftunnubate Kidame, Gudanededu, Lalistu loya, Idokusa, Gorte, Tullu Moti, Gamane Gudane, Ula guto, and Gudane Kobo. The sampling frame was compiled using lists of PAs, cattle owners, and cattle populations in each district. The households were selected based on specific criteria, which included the possession of cattle. The maximum sample size from each herd list (household with animals) was seven, and if a household owned more than seven cattle, only seven were selected at random from the herd list to ensure impartiality.

Data and Sample Collection

The study's purpose was explained to cattle owners in advance. Interviews were conducted using a semi-structured questionnaire, along with the collection of a 10 ml blood sample from each animal. Blood was drawn from the jugular vein using vacutainer tubes. The blood samples were labelled, allowed to clot at room temperature for 24 hours, and then each was centrifuged to separate the serum. The sera were stored frozen at -20°C at the local veterinary clinic until transport to the Bedele Regional

Laboratory (BRL) for analysis. During sample collection, risk factors such as location, age, sex, herd size, and respiratory illness history were recorded for each animal.

Questionnaire survey

The farmers responded to a questionnaire survey to assess their knowledge, attitudes, and practices regarding bovine respiratory illnesses, with a special focus on CBPP. A structured questionnaire was developed in English, translated to Afan Oromo, and pre-tested. The questionnaire covered basic household information such as gender, age, education level, marital status, and family size. It also asked about cattle herd characteristics, including size, sex, and age structure (Appendix 2). In addition, the questionnaire evaluated the farmers' knowledge, attitudes, and behaviors towards respiratory illnesses in cattle, including whether or not their herds had experienced any respiratory diseases, their beliefs about the causes of these disorders, and any infectious infections known to the farmers.

Laboratory Techniques

A total of 768 serum samples were obtained and transported to the Bedele regional laboratory. The sera were tested for antibodies against *Mycoplasma mycoides* subspecies mycoides using a competitive enzyme-linked immunosorbent assay (cELISA) (Appendix 3).

Data Management and Analysis

The data collected was entered into Microsoft Excel 2007 for storage. Statistical analysis was performed using SPSS version 24 software. Descriptive statistics, including frequencies and proportions, were calculated. Seroprevalence was determined by dividing the number of seropositive samples by the total number of animals tested. Associations between risk factors and CBPP seropositivity were analyzed using chi-square tests and odd ratios at a 95% confidence level. A p-value of ≤ 0.05 was considered statistically significant.

Institutional Review Board Ethical Clearance

The Wallagga University Research Ethics Committee granted ethics permission for this research in accordance with World Organization for Animal Health criteria for the ethical handling of animals, and under number WUSVM04/2019

Consent Statement: All cattle owners gave their full approval or permission to use their animals in this study after being thoroughly briefed on what the research would entail.

RESULTS AND DISCUSSION

The study evaluated 768 blood samples from the Hababo Guduru, Abe Dongoro, and Guduru districts of the western regional state of Oromia, and found an overall seroprevalence of 14.3% for CBPP illness in the study area (Table 1). Out of the 768 cattle tested, 110 were seropositive for CBPP, indicating that the disease is a serious health problem for cattle in the western Oromia region. Similar prevalence rates have been reported in other regions. For example, Teklue et al. (2015) found 12% prevalence in the Tigray area of southern Ethiopia, and Alhaji and Babalobi (2016) reported a 14% rate in Niger State, north-central Nigeria. However, the prevalence rates in this current study were higher than those reported by some other researchers. Gizaw (2004) found a rate of 10.3% in the Somali Regional State, and Geresu et al. (2017) reported 6.51% in the Bale zone's Dello Mena and Sawena districts. In contrast, the prevalence rate reported herein was lower than that reported by Ebisa et al. (2015), who found 31.8% in the Amaro district, and by Mersha (2016), who reported 28.5% in selected western Oromia districts. These variations across studies may be attributable to differences in geographical location and animal husbandry practices.

Table 1. Seroprevalence of CBPP at pastoral area (PA; village) level selected from three districts.

Districts	PAs (Village)	No of tested animal	No (%) of sero-positive animals	X^2	P-value
Hababo Guduru	Biftunnubate Kidame	73	7 (9.6%)	7.508	.473
	Gudanededu	54	8 (14.8%)		
	Lalistu loya	72	12 (16.7%)		
Abe Dongoro	Ido Kusa	144	28 (19.4%)		
	Gorte	121	17 (14.0%)		
	Tullu Moti	119	18 (15.1%)		
Guduru	Gamane Gudane	56	8 (14.3%)		
	Ula Guto	69	6 (8.7%)		
	Gudane Kobo	60	6 (10.0%)		
Total		**768**	**110 (14,3)**		

The districts of Abe Dongoro and Hababo Guduru had higher rates of positive blood tests for the disease (16.4% and 13.6%) compared to the Guduru district (10.8%) (Table 2). However, when the data was analyzed, the differences between the districts were not big enough to be considered statistically significant. The villages Idokusa, Gorte, and Tullu Moti had the most animals tested, with 144, 121, and 119 animals respectively. However, fewer animals were sampled from the remaining six villages. The PA-level seroprevalence varied, with Idokusa having the highest percentage (19.4%) and Ula Guto having the lowest percentage (8.7%), but there was no significant difference in CBPP serostatus across the PAs (Table 1). The study revealed that there was a

variation in seroprevalence within districts and PAs. This result aligns with the findings of Geresu et al. (2017), who noted a similar pattern in the Bale zone of Ethiopia – the Dello Mena district had a higher rate of positivity (8.26%) compared to the Sawena district (3.89%), but in that study, statistically, the difference between the two districts was not significant. Depending on different factors indicating the presence of CBPP infection, various management systems may be used, such as sharing grazing and watering facilities and having a large livestock population in the district.

Table 2. Seroprevalence of CBPP disease in cattle by age, sex, body condition status (BCS) and district analysis

Variables	Categories	No of animal tested	No (%) of sero-positive animals	X^2	P-value
Sex	Female	450	50 (11.1%)	8.515	0.003*
	Male	318	60 (18.9%)		
Age	Young	351	38 (10.8%)	5.927	0.011*
	Adult	417	72 (17.3%		
BCS	Poor	254	61 (20.2%)	18.311	0.000*
	Medium	211	30 (14.2%)		
	Good	303	19 (7.5%)		
Districts	Hababo Guduru	199	27 (13.6%)	3.310	0.191
	Abe dongoro	384	63 (16.4%)		
	Guduru	185	20 (10.8%)		

BSC= Body condition score; PA= Peasant association; X^2= Chi square and *=statistically significant.

The results of the study revealed that adult cattle had a higher rate of seropositivity for CBPP (17.8%) compared to young cattle (10.8%; p-value 0.011). The incidence of poor body condition (17.8%) was significantly higher than the rates of medium (14.2%) and good (7.5%) body condition. Table 2 shows the percentage of cattle that tested positive for CBPP (seroprevalence) based on their age, sex, and body condition.

The results of the odd ratio calculation showed that adults were nearly twice as susceptible as young, males were more susceptible than females, and cattle with poor body condition were three times more susceptible than cattle with good body condition and twice as susceptible as cattle with medium body condition. These differences were statistically significant as shown in Table 3.

CBPP seroprevalence was highest in cattle with poor body condition, lower in those with moderate body condition, but lowest in those with excellent body condition (overall p-value of 0.000). This conclusion supports the results of Ebisa et al. (2015), Suleiman et al. (2015), and Mtui-Malamsha (2009). The reasons for this could be that poorly conditioned cattle have a limited protective immunological response compared to properly conditioned cattle. A decrease in physical condition is one of the signs of infection in an animal. Cattle with chronic CBPP often lose weight because of the disease's effects. Healthy animals can mount a stronger immune response against the

infection compared to cattle in moderate or poor condition (Radostits et al., 2007). The finding in this study that seropositive cattle were in worse physical shape than seronegative ones aligns with the understanding that CBPP takes a toll on infected animals' body condition.

Table 3. Seroprevalence degree of association analysis across potential risk factors using multivariate logistic regression

Risk factors		No of animal tested	No of seropositive animals	OR (95% CI)	p-value
Sex	Female	258	50	1.769 (1.162-2.695)	0.008*
	Male	510	60		
Age	Young	351	38	0.622 (0.402-0.960)	0.030*
	Adult	417	72		
BCS	Poor	254	61	3.000 (1.717-5.241)	0.000*
	Medium	211	30	2.003 (1.079-3.718)	
	Good	303	19		

CI = confidence interval at 95%; OR = Odds ratio; BCS = body condition score; and *=statistically significant.

The questionnaire survey collected responses from 200 cattle owners across three districts – 24% from Guduru, 26% from Hababo Guduru, and 50% from Abe Dongoro. Most of the respondents (77%) were male, with 23% being female. The age range of respondents was 18 to 78. The breakdown of age ranges includes 20.5% between 41-55 years old, 35% between 31-40 years, 27.5% over 55 years old, and 17% between 18-30 years old.

In terms of education levels (Table 4), 54 respondents (27%) had completed elementary school, 48 (24%) completed secondary school, 18 (9%) completed college or university, 24 (12%) completed vocational school, and the remaining 56 (28%) had no formal education.

In a sample of 200 respondents, 56 had no formal education, while 144 had education levels ranging from elementary to university. Awareness of CBPP disease was higher among illiterate respondents – 62.5% (35 out of 56) were aware of CBPP. In comparison, only about 38% (55 out of 144) of respondents with at least some formal education knew about CBPP disease. In summary, a greater proportion of respondents without any formal education were aware of CBPP compared to those with elementary to university level education.

Looking at the awareness levels within each education category (Table 4) shows that 61% (11 out of 18) of respondents educated up to the college/university level were aware of CBPP, 42% (10 out of 24) of respondents with vocational education knew about CBPP, 37.5% (18 out of 48) of those educated up to secondary level were

aware of CBPP, and 26% (14 out of 54) of respondents with primary education had knowledge of CBPP disease. In summary, higher levels of education correlated with greater awareness of CBPP disease, with over 60% of college/university educated respondents being aware of CBPP compared to only 26% awareness among those with just primary education.

Table 4. Knowledge, attitudes and practice of respondents based on education level

Awareness of CBPP Disease No formal education		**Educational level of the respondents**				
		Primary school	**Secondary school**	**Vocational School**	**College**	
Do you know CBPP disease?	**Yes**	35 (62.5%)	14 (26%)	18 (37.5%)	10 (42%)	11 (61%)
	No	21 (37.5%)	40 (74%)	30 (62.5%)	14 (58%)	7 (39%)
Have you heard about CBPP disease?	**Yes**	19 (34%)	24 (44.5%)	19 (39.5%)	11 (46%)	7 (39%)
	No	37 (66%)	30 (55.5%)	29 (60.5%)	13 (54%)	11 (61%)
Has your neighbor had any problems with cattle RD?	**Yes**	26 (46%)	34 (63%)	27 (56%)	14 (58%)	9 (50%)
	No	30 (54%)	20 (37%)	21 (44%)	10 (42%)	9 (50%)
Do you think infectious disease can cause RD?	**Yes**	33 (59%)	34 (62.5%)	24 (50%)	9 (36%)	6 (33%)
	No	23 (41%)	20 (37.5%)	24 (50%)	15 (64%)	12 (67%)
Do you know the factors that cause RD?	**Yes**	16 (28.5%)	4 (7%)	7 (15%)	5 (21%)	5 (28%)
	No	40 (71.5%)	50 (93%)	40 (85%)	19 (79%)	13 (72%)
Do you know the effective CBPP prevention and control methods?	**Yes**	8 (15%)	4 (7%)	5 (26%)	6 (25%)	7 (39%)
	No	46 (85%)	50 (93%)	14 (74%)	18 (75%)	11 (61%)
Segregation of infected animals	**Yes**	0%	0%	6 (12.5%)	0%	0%
	No	56 (100%)	54 (100%)	42 (79.5%)	24 (100%)	18 (100%)
Isolation of newly introduced animals		0%	0%	0%	4 (17%)	0%
		56 (100%)	54 (100%)	48 (100%)	20 (87%)	18 (100%)
Regulations through testing and killing, or eradication	**Yes**	0%	0%	0%	0%	0%
	No	56 (100%)	54 (100%)	48 (100%)	24 (100%)	18 (100%)

RD=respiratory disorder; CBPP=contagious bovine pleuropneumonia

The majority of the participants observed were aware of symptoms such as grunting while coughing or exhaling, head extended coughing, dilation of the nostrils and mucoid discharge, swelling of the throat and dewlap, labored and painful breathing, standing with the elbows abducted, frothy saliva at the mouth, and polyarthritis in the young. However, only a minority of participants observed chest pain as a symptom (Table 5).

Most respondents had limited knowledge about how CBPP disease transmits. The main possible transmission routes are close contact with sick animals and coughing from infected animals. However, only 66% and 63% of respondents, respectively, were aware of these factors. Alarmingly, only 8% of participants knew that CBPP can also spread through contaminated embryonic membranes and uterine discharge from

diseased animals. Table 6 highlights the lack of awareness in the community about the potential transmission channels for CBPP.

Table 5. Farmers' knowledge assessment related to major symptoms of CBPP disease

Major CBPP symptoms	Yes (%)	No (%)	I don't know (%)
Dilation of nostril & mucoid discharge	150(75%)	34(17%)	16(8%)
Stand with the elbows abducted	82(41%)	66(33%)	52(26%)
Standing with back arched	90(45%)	52(26%)	58(29%)
Head extended coughing	140(70%)	28(14%)	32(16%)
Labored & painful breathing	102(51%)	58(29%)	40(20%)
Grunting when exhaling (coughing)	144(72%)	32(16%)	24(12%)
Chest pain	30(15%)	108(54%)	62(31%)
Frothy saliva at the mouth	102(51%)	76(38%)	22(11%)
Polyarthritis particularly on young	44(22%)	134(11%)	22(11%)
Swollen throat and dewlap	116(58%)	58(29%)	26(13%)

Table 6. Farmers' knowledge regarding the possible transmission routes of contagious bovine pleuropneumonia

What is route of transmission for CBPP disease?	Yes (%)	No (%)	I don't know (%)
Close Contact	132(66%)	28(14%)	40(20%)
Inhalation	112(56%)	24(12%)	64(32%)
Fetal Membrane & Uterine Discharge	16(8%)	34(17%)	156(78%)
Fomites/Objects	38(19%)	76(38%)	86(43%)
Coughing	126(63%)	20(10%)	54(27%)
Common Grazing Land	60(30%)	50(25%)	90(45%)

The study findings indicated that the respondents had knowledge about the economic impacts of CBPP disease on livestock, including a 7% reduction in growth rate and a 4.5% decrease in fertility rate. While 46.5% had some knowledge of disease prevention and control measures like decontaminating contaminated areas, treating unhealthy animals, and immunization (37.5%), none of the participants were aware of regulations concerning testing, killing, or eradication. Moreover, only 12% were aware of the need to segregate newly infected cattle from the herd in order to control CBPP. CBPP sickness negatively affects livestock output, with farmers concerned about the cost of treating sick animals (41%), animal mortality due to the disease (28%), and reduced productivity (25%).

Despite the questionnaire survey confirming the existence of CBPP in this study, most farmers lacked awareness about CBPP disease specifically. However, they were cognizant of the symptoms and impacts of respiratory diseases in cattle in general, even though they could not identify CBPP itself. The questionnaire revealed the most popular disease prevention methods used by the cattle owners were vaccination (37.5%

of respondents), treatment of ill animals (41.5%), isolating and properly managing newly bought cattle (17%), and cleaning animal housing (4%).

The researchers determined that because of the limited knowledge about CBPP among the cattle owners, if there was an outbreak, many farmers would be uncertain how to respond or would not take any action. The lack of disease awareness in the community poses a serious threat for uncontrolled spread of CBPP if an epidemic should occur. Therefore, communicable diseases such as CBPP could spread quickly and infect a significant number of cows in the study area. These findings are consistent with Mersha's (2016) results in Western Oromia and findings reported by Kairu-Wanyoikea et al. (2014) findings in Narok District, Kenya.

CONCLUSION AND RECOMMENDATIONS

In conclusion the study found a high rate of cattle infected with CBPP and low awareness of the disease among cattle owners in the region. This suggests significant economic impacts from illness and death of cattle. CBPP restricts international animal movement, reduces export profits, and harms farmers' livelihoods. Despite the threat CBPP poses to the country's economy, little has been done to limit its spread. To combat this, we suggest that federal, state, and district veterinary offices take measures to prevent epidemics, including consistent vaccination with symptomatic animal treatment. Governments should prioritize CBPP prevention and treatment, with further research needed to understand its temporal pattern in the country. Farmers should be educated on the economic importance, transmission routes, and control approaches for CBPP through veterinary education and media attention. Rules and regulations should be put in place to prevent and control the disease, and herd management and animal movement regulation within communities should be carefully managed.

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Authors' contributions

TM was responsible for data collection and prepared the initial draft of the manuscript. AK and EH reviewed the manuscript sections and provided contributions to improve the draft. EH took on the role of finalizing the manuscript for submission.

Competing interests

The authors declare that they have no competing interests

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PLUĆNA ZARAZA GOVEDA, SEROPREVALENCIJA I FAKTORI RIZIKA U OBLASTI HORO GUDURU VELEGA ZAPADNE ETIOPIJE

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Kratak sadržaj

Bolesti životinja predstvaljaju veliki problem u pogledu zdravstvene zaštite životinja i egzistencije farmera u Etiopiji. Plućna zaraza goveda (CBPP) je jedna od njih i uzrokuje je *Mycoplasma mycoides subsp. mycoides*. Da bi se procenila situacija, sprovedena je studija u Horo Guduru Valagi oblasti u Etiopiji. Ključni cilj bio je da se utvrdi seroprevalencija kod goveda i proceni znanje, stavovi i prakse farmera u vezi sa ovom bolešću. Istaživanje je sprovedeno od oktobra 2019. do juna 2020. godine. Uzorci krvi goveda (n=768) su ispitani cELISA testom. Sprovedeno je i anketiranje farmera (n=20 domaćinstava) u tri okruga. Rezultati su pokazali da je 14,3% goveda bilo pozitivno na CBPP antitela. CBPP seroprevalencija je bila 16,4% u Abe Dongorou, 13,6% u Hababu Guduruu i 10,8% u Guduruu i nije utvrđena statistički značajna razlika. Anketa farmera je otkrila nedostatke u znanju – samo 4,5% je prepoznalo CBPP kao bolest koja uzrokuje smanjeni rast i produktivnost. U zaključku, ova studija je otkrila visoku seroprevalencu CBPP, što ukazuje na aktivnu infekciju u uzorkovanoj populaciji goveda. Neophodni su usmereni napori u obrazovanju i kontroli bolesti da bi se sprečilo njeno dalje širenje. Rezultati upitnika naglašavaju potrebu za obukom farmera o rizicima, prevenciji i lečenju CBPP-a.

Ključne reči: goveda, antitela, *Mycoplasma*, infekcija