MAS Journal of Applied Sciences / Uygulamalı Bilimler Dergisi
ISSN: 2757-5675
masjaps.com

Socio-Economic Impact of Brucellosis in Cattle At Banadır Region, Somalia

Abdullahi Mohamed HUSSEIN[1*] (Orcid ID: 0000-0001-8042-0088), Zahid Tevfik AĞAOĞLU[1] (Orcid ID: 0000-0001-5963-1737)
[1]University of Cumhuriyet Sivas, Faculty of Veterinary Medicine, Department of Internal Medicine, Turkey
*Corresponding author (Sorumlu yazar): cabqari144@gmail.com

Abstract

Brucellosis is a highly contagious zoonotic and devastating disease that affects households" potential to improve their well-being through trade in livestock and livestock commodities. Despite the disease being endemic in Somalia, there is inadequate information, on its socio-economic impact. Therefore, a cross-sectional study was conducted in Banadir region, Somalia to determine the impact of brucellosis on socio-economic wellbeing of cattle farmers at household and livestock exporters. The specific objectives of the study were to investigate the Socio economic impact of Brucellosis at households; and to identify their impacts on livestock exporters. Structured questionnaires and key informant interviews were used to collect both quantitative and qualitative data in this research. The study population is comprised of households, livestock exporters, and the estimated target population was 40 people. Therefore the sample of the study was 36 respondents drawn from the estimated target population. The data are code and analyses by using Statistical Package for Social Sciences (SPSS) computer software Version 22.0. All costs and monetary losses were in households was due to abortions accounting for 32,400,000 Sh.SO equivalents to USD 1,350. Animals were exposed to. Losses due to discarded milk from infected herds at household level (3,360,000equivalent to USD 140). Similar results have been reported in Sudan by Angara et al. (2016) who estimated the quantity of milk lost due to brucellosis to be Sudanese Pounds (SDG) 30,302,212.2 (Equivalent to USD 6,587.4). This study has established that brucellosis is an important livestock production constraint that results in farmers losing a significant amount of income due to losses and costs attributed to the disease such as abortions, milk loss, and costs of vaccination, livestock mortality and trade barrier.

Keywords: Brucella, cattle, Mogadisho-Somalia

INTRODUCTION

Brucellosis is a highly contagious zoonotic bacterial disease of public health, wildlife and livestock importance (Glynn and Lynn, 2008). The disease is caused by ten species of the Genus: Brucella and distributed worldwide (Corbel et al., 1997). Susceptibility to brucellosis varies among individual animals. It depends on the animals' natural resistance, age, sex, level of immunity and environmental stress (Ahmed, 2009). The etiologic agent of brucellosis is small, aerobic Gram-negative rods of the genus Brucella. To date, ten species are recognized within the genus Brucella. The genus Brucella consist of six classic species which include; B. melitensis, B. abortus, B. suis, B. ovis, B. neotomae and B. canis. The B. melitensis biovars (bvs) 1-3 (mainly isolated from sheep and goats), B. abortus bvs 1-6 and 9 (from cattle and other bovidae), B. suis bvs 1- 3 (from pigs), bvs.4 (from reindeer) and bvs.5 (from small rodents), B. canis (from dogs), B. ovis (from sheep) and B. neotomae (from desert wood rats). ccording to data from OIE for 2004, Cameroon, Ethiopia, Kenya, Nigeria, Tanzania, and Uganda reported the existence of human cases of brucellosis, while in 2003 similar reports indicated that Ghana, Togo, and Chad are probably also endemic according to sero epidemiological studies (Schelling et al., 2003). In Africa and central Asia, the incidence of brucellosis is generally considered higher in pastoral settings. However, because of the difficulty to access pastoral communities, the occurrence and the control of brucellosis is poorly understood both in humans and their animals in the pastoral settings of the subSaharan Africa where the burden of the disease could be high (Mcdermott and Arimi, 2002). As a part of sub-Saharan Africa (SSA). Somalia has a potential to improve socioeconomic well-being of livestock farmers through trade in livestock and livestock commodities. However, such potential is hampered by the presence of numerous disease challenges such as brucellosis.and also Somalia is a country which around 60 % of the GDP of the country and 90 % of the export earnings comes from livestock, in addition to that since there is no fully functioning government and the public health and zoonosis department is not established yet plus lack of recent baseline information of disease, this study (Socio-economic Impact of Brucellosis at household level and small enterprise in Banadir region) becomes very valuable and necessary.

MATERIALS and METHODS

A cross-sectional study was carried out to determine Socio-economic Impact of Brucellosis at household level and small enterprise in Banadir region, Somalia. The cross-sectional design was chose because of collecting data at a single point in time is economical in terms of time, financial resources and nature of the study objectives (Kothari, 2004). This study concerned some among the household heads and managers of enterprise. The target population would be 40 while total of 36 is a sample size that divided in two parts. Therefore sampled groups of respondents in each in brackets were: household heads and exporters. Sampling Procedure Four districts, (*Hodan,Hiliwaa, Wadajir and Dayniile*) were purposively selected because of their livestock production system, which was mainly traditional and also the history of brucellosis in cattle herds and exporters whose their Cattle reject due to brucella Seropositivity .The study would be utilized questionnaires. Questionnaires were randomly

administered to the respondents in the selected wards. 12 household heads, 13 Quarantine and 11 exporters are considering. Questions were asked and recorded in English. For the respondents who cannot read and write, questions were be interpreted in the local languages (Somali). The data are code and analyses by using Statistical Package for Social Sciences (SPSS) computer software Version 22.0.

RESULTS

It was observed that losses due to mortality among brucella suspected cattle were 33.3% and the loss was estimated at 31,200,000 sh.so equivalent to USD 1,300. Moreover, 75% of infected cows had experienced abortions attributed to brucellosis. The monetary losses due to abortions were estimated to be 32,400,000 sh.so equivalents to (USD 1,350. An estimated 280 litres of milk was discarded due to suspected brucellosis infection in cattle herds. The total monetary value of milk discarded by the households per year was estimated to be 3,360,000 sh.som. Equivalent to USD 140. It was also revealed that 100% of livestock farmers in the area did not vaccinate their livestock against brucellosis due to either lack of money to buy the vaccines and poor access to livestock services.

Table 1. Estimated annual economic losses and costs incurred due to brucellosis at house holds

Indicators	Quantity Unitcost (shilling somalia)	Monetary value(sh.somali)	USDEquivalen
Losses due to mortality among cattle	cows in 4 HHS 7,800,000	31,200,000	1,300.
Aborted cows	9 cows in 9HHS 3,600,000	32,400,000	1,350
Milk lost	280litres 12,000	3,360,000	140
Prolonged intercalving perio	9 cows in HHS 3,600,000	32,400,000	1,350
Total		99,360,00	4,140

1.Costs and Losses due to Brucellosis at Household Level

Table 2. Estimated annual economic losses and costs incurred due to brucellosis at exporters

Indicators	Quantity	Unit cost (sh.so)	Monetary value(sh.so)	USDEquivalent
Losses due to reject	6000	7,800,000	46, 800,000,000	1,950,000
Loss due to sold local market	4,800	360,000	1,728,000,000	72,000
Losses due to keep& treatment	1200	600,000	720,000,000	30,000
Total			49,248,000,000	102,000

2: Costs and Losses due to Brucellosis at animal exporters

It was observed that losses due to rejected among brucella seropositive cattle was 76% and the loss were estimated at46, 800,000,000 sh.so equivalents to USD 1,950,000 Moreover, 80% of infected cows had sold to the local market. The monetary losses due to sell was estimated to be 1,728,000,000 Sh.So equivalent to USD 72,000. 20% of exporters keep and treat their animals. The monitory losses were estimated 720,000,000 Sh.Som equivalents to USD 30,000.

DISCUSSION

Impact of Brucellosis at the Household Level and exporters This study was conducted in the Banadir region, Somalia to determine Socio-economic impact of Brucellosis in Banadir region, Somalia. The study has revealed that brucellosis had an impact on the socio economic well-being of cattle farmers and animal exporters " households and consequently leading to loss of income due to abortions, milk loss, cost of vaccination, mortality, prolonged inter calving period and barrier of trade. The highest estimated amount of money lost in households was due to abortions accounting for 32,400,000 Sh.SO equivalents to USD 1,350. These results are also comparable to those obtained by Angara et al. (2016) estimated economic losses due to the number of aborted calves to be Sudanese Pounds (SDG) 303,348.3 (Equivalent to USD 65,945.5). Further, MWINYI OMARY,.(2017) who estimated abortion losses due to brucellosis of 1,536,000.00 ZMW (equivalents to USD 134,148.47). The main reason that was advanced by the farmers for not vaccinating their cattle was lack of money to buy vaccines. Further, the losses due to abortions may be attributed to the kind of management system the animals were exposed to. Losses due to

discarded milk from infected herds at household level (3,360,000equivalent to USD 140). Similar results have been reported in Sudan by Angara et al. (2016) who estimated the quantity of milk lost due to brucellosis to be Sudanese Pounds (SDG) 30,302,212.2 (Equivalent to USD 6,587.4). The study further revealed that there were Costs and Losses due to Brucellosis at animal exporters. The highest estimated amount of money lost in livestock exporters was due to rejection of animals accounting for 46, 800,000,000 Sh.So equivalents to USD 1,950,000

ACKNOWLEDGEMENTS

REFERENCES

Alton, G.G. 1990. In: Nielsen K, Duncan JR, eds. Animal brucellosis. Boca Raton, FL: CRC Press, 379.

Alton Jones, A.R., Verger, J. 1988. Techniques for the Brucellosis laboratory. Institute National de la Recherche Agronomique.

Biancifiori, F. 1996. Compend Immunol Microbiol Infect Disease 19:17.

Blasco, J.M. 2006. Existing and future vaccines against brucellosis in small ruminants. Small Ruminant Research, 62(1): 33-37.

Blasco, J.M., Molina-Flores, B. 2011. Control and eradication of Brucella melitensis infection in sheep and goats. Veterinary Clinics: Food Animal Practice, 27(1): 95-104. Bricker, B.J. 2002. PCR as a diagnostic tool for brucellosis. Veterinary microbiology, 90(1-4): 435-446.

Bricker, B.J., Halling, S.M. 1994. Differentiation of Brucella abortus bv. 1, 2, and 4, Brucella melitensis, Brucella ovis, and Brucella suis bv. 1 by PCR. Journal of clinical microbiology, 32(11): 2660-2666.

Bricker, B.J., Ewalt, D.R., Olsen, S.C., Jensen, A.E. 2003. Evaluation of the Brucella abortus species–specific polymerase chain reaction assay, an improved version of the Brucella AMOS polymerase chain reaction assay for cattle. Journal of veterinary diagnostic investigation, 15(4): 374-378.

Bshop, G.C., Busman, P.P., Herr, S.D. 1994. Brucellosis: In Cotzer, Thomson and Tustin (eds), Infectious disease of live stock. Oxford University Press. 2: 1053-1066.

Chukwu, C.C. 1987. Brucellosis in Africa; Part II: The prevalence of animal Brucellosis.

Clavareau, C., Wellemans, V., Walravens, K., Tryland, M., Verger, J.M., Grayon, M., Godfroid, J. 1998. Phenotypic and molecular characterization of a Brucella strain isolated from a minke whale (Balaenoptera acutorostrata). Microbiology, 144(12): 3267-3273.

Cloeckaert, A., Verger, J.M., Grayon, M., Grepinet, O. 1995. Restriction site polymorphism of the genes encoding the major 25 kDa and 36 kDa outermembrane proteins of Brucella. Microbiology, 141(9): 2111-2121.

Diaz-Aparicio, E., Hernandez, L., Suárez-Güemes, F. 2004. Protection against brucellosis in goats, five years after vaccination with reduced-dose Brucella melitensis Rev 1 vaccine. Tropical animal health and production, 36(2): 117-121.

European Commission 2001. Brucella melitensis. Retrieved January 26, 2012 from http://ec.europa.eu/food/fs/sc/scah/out59_en.pdf.

FAO 2003. Guidelines for coordinated human and animal brucellosis surveillance.FAO Animal Production and Health Paper 156, Rome, Italy. Pp. 1–45.

Funk, N.D., Tabatabai, L.B., Elzer, P.H., Hagius, S.D., Martin, B.M., Hoffman, L.J. 2005. Indirect enzyme-linked immunosorbent assay for detection of Brucella melitensis-specific antibodies in goat milk. J. Cl. M. 43(2):721-735

Gupta, V.K., Verma, D.K., Rout, P.K., Singh, S.V., Vihan, V.S. 2006. Polymerase chain reaction (PCR) for detection of Brucella melitensis in goat milk. Small Ruminant Research, 65: 79-84

Kuzdas, C.D., Morse, E.V. 1953. A selective medium for the isolation of brucellae from contaminated materials. J. Bacteriol. 66: 502-534.

McDermont, J.J., Arimi, S.M. 2002. Brucellosis in sub-Saharan Africa: epidemiology, control and impact. Vet Microbiol., 20: 111–134.