

Economic impact of east coast fever in central equatorial state of south Sudan

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Economic impact of two outbreaks of east Coast fever (ECF) was assessed in two cattle camps in Juba district, central equatorial state, south Sudan. The overall losses were estimated at both camps to amount to US\$ 134 325. Mortality due to ECF represented major cause of economic losses (81.5%), while loss of milk production and costs of control were relatively low. The magnitude of economic losses due to ECF on cattle and resources and its impact on livelihood were discussed.

Keywords: East coast fever, economic impact, south Sudan.

INTRODUCTION

Livestock perform a wide variety of economic and social functions in house-hold and national economies. They are primary investment resources which generate food (meat, milk), cash income, fuel, clothing, employment and capital stock. They provide manure and draught power for crop production. They are stores of wealth which provide a sense of security, prestige, social status and cultural value. In addition, livestock convert crop waste and by-product as well as forages; otherwise useless to man; into useful products.

Ticks and tick borne diseases seriously limit livestock production and improvement in most of African countries (Norval et al., 1992). Ticks and diseases they transmit are present throughout the different ecological regions of world, their impact on animal health and production is similar (FAO, 1984). In addition to being efficient vectors of disease agents, tick may cause direct economic damage to livestock. McCosker (1979) estimated that 80% of the world population of cattle is at risk from ticks and tick-borne diseases, with global annual losses amounting to US\$ 700 million. East Coast fever, caused by *Theileria parva* and transmitted by *R. appendiculatus* is responsible for the death of thousands of cattle each year in east and central Africa. Mukhebi et al. (1992)

estimated the annual losses due to *T. parva* in central and east Africa at US\$ 168 million.

In Sudan, Siddig et al (2003) reported the total losses due to an outbreak of tropical theileriosis in a dairy farm in Khartoum State to be about US\$ 62,000. However, Latif (1994) estimated the losses due to *T. annulata* in Khartoum to reach 4-6 million dollars annually. Furthermore, tropical theileriosis was shown to cause substantial economic losses to dairy farms in the Northern State (Gamal and ElHussein, 2003). In Juba endemic area of East Coast fever, Marcellino (2004) estimated cost of treatment to range between 20 US\$ per calf and US\$ 40 per cow when using Butalex and from US\$ 15 per calf and US\$ 30 per cow when using parvexon to treat the disease.

The aim of this study was to assess the economic impact of ECF in terms of mortality, production losses and treatment and control expenses.

MATERIALS AND METHODS

Assessment of economic impact of ECF

Data and information collected from two cattle camps

The relevant information were gathered and recorded in two cattle herds. The first outbreak was lasted from July to

Table 1. Information recorded during the investigation of East Coast fever out breaks in two cattle camps around Juba in Central Equatoria State

Criteria	Cattle camp No 1	Cattle camp No 2	Average
Animal population	1000	2460	1 730
Number and percentage of animals affected	320 (32%)	354 (14.4%)	337 (23.2%)
Case fatality	26.7	38.7	32.7
Number and percentage of animals treated and recovered.	207 (20.7%)	217 (8.8%)	212 (14.8%)
Number and percentage of animals died	85 (8.5%)	137 (5.7%)	111 (7.1%)

Table 2. Chemotherapy applied to control East Coast fever in two camps around Juba in Central Equatoria State

Criteria	Cattle camp No 1	Cattle camp No 2
Anti thelerial drug Parvaquone (Parvexon)	36 vials (100 ml)	85 vials (50 ml)
Oxytetracycline 20% L,A	154 vials (100 ml)	199 vials (100 ml)
Acaricide (Cypermethrin)	60 tins (250 ml)	30 tins (250ml)

August 2004 at Kamiro cattle camp 10 Km North West of Juba town and the second outbreak study was in December 2005 and January 2006 at Surai cattle camp north of Juba Airport. Information recorded included animals population at risk, number of animals affected, number of animals treated and recovered, veterinary drugs used to control the outbreak which include Parvaquone (Kipro, Netherland), oxyteteracyline 20% L.A (Farmaswede, Egypt), and chemical acaricides (cypermethrin) and number of animals died due to ECF were recorded. Information from questionnaire administered during the general survey and some Participatory Rural Appraisal (PRA) techniques namely semi-structured interview with herders met in cattle camps.

Other information was also recorded such as livestock market prices, drug prices, and drop in milk production and milk prices. All the information recorded was then subjected to analysis.

RESULTS

The morbidity rates recorded in the first outbreak in the first cattle camp was 32% (320/1000), while in the second outbreak in the second camp it was 14.4% (354/2460). The case fatality ranged between 26.7% (85/320) in the first camp and 38.7% (137/354) in the second camp while the mortality rate was 8.5% (85/1000) in the first camp and 5.7% (137/2460) in the second camp (Table 1).

In the first cattle camp, the milk yield was 210 bottles daily (A bottle is equivalent to $\frac{3}{4}$ liter), and it dropped to 120 bottles per day, with a loss of 90 bottles per a day, the total loss during the two-month was 5580 bottles. Milk prices at the time of the study were 1.5 Sudanese pounds per a bottle, amounting to a total loss of US\$ 4,185.

The cost of control measures in terms of drugs and acaricides used amounted to US\$ 3,988 for the first cattle camp while it was US\$ 4,441 for the second cattle camp (Tables 2 and 3). Losses due to mortality were estimated at average to be US\$ 54,750 in both cattle camps (Table 3).

The overall loss for first cattle camp was estimated at US\$ 55,741 and for the second cattle camp was US\$ 78,585). Overall the total losses in the two cattle camps in the period of the study were estimated to be US\$ 134 325.

DISCUSSION

The economic losses due to theileriosis have been divided into direct and indirect (Norval et al., 1992). The direct production losses are those that are directly attributable to presence of disease in cattle population through morbidity and mortality. Other losses are related to the animal recovered from theileriosis that may suffer from weight loss, produce low milk yields, provide less draught power, and suffer from reduced fertility and delays in reaching maturity.

Table 3. Economic impact of East Cost Fever estimated for two cattle camps in Central Equatoria State (in US\$)

	Cattle camp No.1	Cattle camp No. 2	Average	Total
Cost of control	3988	4441	4 214.5	8429
Losses due to mortality	42500	67000	54 750	109500
Losses in milk production	4185	Nil	2 092.5	4185
Subtotal	50673	71441	61 057	122114
10 % (Labor, Vet care, Handling charges and others)	5068	7144	6 106	12212
Grand total	55741	78585	67 163	134325

Indirect losses are more complex and difficult to estimate, however they must be identified and evaluated to provide more comprehensive assessment of the impact of disease on society (Siddig *et al.*, 2003). Therefore the result reached during this study reflects minimum losses, where only mortality and morbidity (number of animal treated) cost of disease control and milk losses in only one cattle camp is considered.

During the assessment of economic impact of ECF in the present study it has been estimated that the morbidity rate was 14.4% and 32% and the case fatality ranged between 26.7% and 38.7% in two cattle camps.

The milk losses was estimated to be US\$ 4185 in first cattle camp, while in the second cattle camp it was not estimated as the study was conducted in dry season during which milk normally drops even without the disease due to inadequate pasture. The overall losses was US\$ 134 325 in the two cattle camps.

The quantification of the total cost of a disease can be of value in demonstrating the magnitude of economic damage, which can help in planning and development of disease control strategy and deciding the good option for the control.

Despite the inadequacies of data used here, the results gave evidence that ECF causes substantial economic losses in cattle and resources in the study area. The results indicated each family (household) normally need to sell three to five bulls every year to pay for cost of antitheilerial drugs, antibiotics and chemical acaricides. In addition, death of calves may lead to drastic drop in milk yield, as calves are needed to induce the milk from dams. Impact of disease on livelihood of the communities/ household might include inadequate access to food, health facilities, educational opportunities, community participation and social interaction. Their chance for combating and reducing poverty is minimized and vulnerability level increases and the response to risk becomes poor, as livestock represent the alternative source in case of crops failure or in the event of disasters.

The greatest impact of ECF (Towan lo Juba) was on payment of dowry, ceremonial rituals and payment of compensations as it was the case for most livestock diseases.

In conclusion, the highest economic impact was accrued by mortality representing 81.5% of the losses accrued by ECF. Costs of control measures using drugs, acaricides are almost similar to that caused by loss in milk production.

ACKNOWLEDGMENT

Supported in part by the German African Cooperation Project (DFG) "Molecular epidemiology network for promotion and support of delivery of life vaccines against *Theileria parva* and *Theileria annulata* infection in Eastern and Northern Africa" (AH 41/7-1).

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