

Prevalence and Monetary Loss due to Bovine Fasciolosis in Juba Slaughter House South Sudan

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Abstract: Study on Prevalence and Monetary Loss from liver condemnations due to bovine fasciolosis was conducted in Juba main slaughter house for three months as of May to July 2012. A total of 4,642 indigenous Nilotic and exotic Ankole cattle breeds were investigated. Nilotic cattle revealed high prevalence of 96.8% compared to 2.5 % in Ankole cattle attributed to *Fasciola gigantica* during post-mortem examination. Likewise, fecal examination revealed a prevalence of 89.6% in Nilotic and 2.9 % in Ankole cattle breed. This significant difference in prevalence rate between the two breeds might be attributed to de-worming regimens taken prior to importation of Ankole cattle from Uganda to South Sudan. Fasciolosis was found to be responsible for a condemnation of 36.4% inspected livers suggesting fasciolosis as one of the priority diseases of economic importance in South Sudan. The sum of monetary losses revealed 45,180 SSP (15,227.5 USD) and 17,560 SSP (5,918.4 USD) in total and partial liver condemnations, respectively. Further epidemiological and molecular studies are needed to develop strategies for the control of bovine fasciolosis in South Sudan.

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1. Introduction

Bovine fasciolosis due to *Fasciola hepatica* and *F. gigantica* is one of the economically important snail-borne parasitic diseases of cattle in tropical and subtropical countries that limits animals productivity (Dechasa *et al.*, 2012). The snails *Lymnaea natalensis*, the intermediate hosts of *F. gigantica*, commonly occur in northern Gezira and southern Khartoum State, Sudan culminating in high prevalence of fasciolosis (Atta Elmanan *et al.*, 2001). Recent evidence has shown that bovine fasciolosis is endemic in swampy areas of Northern Bahr el- Ghazal, Jonglei, Lakes and Central Equatoria States (Anon, 2010). Furthermore, previous reports in the then southern Sudan showed higher incidence of the disease as 33%, 56% and 47% in Equatoria, Bahr El Ghazal and Upper Nile Provinces, respectively (Karib, 1962).

The economic losses due to bovine fasciolosis are enormous. They are attributable to a number of factors including livers condemnation, increased susceptibility to secondary infections and expense of control measures (Ibrahim *et al.*, 2010). However, no or little progress has been made to investigate the prevalence and estimate the monetary loss due to bovine fasciolosis in Central Equatoria State (CES), South Sudan.

The purpose of the study was to determine the prevalence of the disease and estimate the monetary losses due to livers condemnation among indigenous

Nilotic and exotic Ankole cattle in Juba main Slaughter House, South Sudan.

2. Material and Methods

2.1 Study Area

Juba lies in the tropical climate at 0346475 and 0346484 °N and 0535105 and 0535139 °E, and at the elevation of 460 meter using global positioning system (GPS). Annual ambient temperature ranges from 24.7°C to 34.5°C, the mean relative humidity stands at 55% and the rainy season usually commences in April and ends in November. Livestock are brought daily for marketing and slaughter purposes from various locations such as Rumbek, Terekaka, Bor, Pibor and the neighbouring Uganda.

2.2. Study Design

A total of 4,642 adult cattle which included 713 indigenous (Nilotic) and 3,929 exotic (Ankole) breed imported from Uganda were investigated. 150 fecal samples were collected from 48 indigenous Nilotic and 102 exotic Ankole cattle for detection of fasciola eggs employing sedimentation techniques. The study was designed based on cross sectional type to determine the prevalence rate and estimate monetary loss due to liver condemnations using anti-mortem and post-mortem examinations for each adult indigenous and exotic cattle. Estimation of monetary losses was assessed through participatory approaches including meetings and interviews with retailers, cattle owners and butchers. The prices were taken from the current retail price of 40 SSP per 1 Kg of liver. The

calculation was made from 439 partially and 251 totally condemned livers.

2.3 Data Management and Analysis

Data from the Slaughter house figures during meat inspection were recorded on daily basis. Data analysis was made using a computerized programme package.

3. Results

3.1 Prevalence of fasciolosis

The prevalence of the disease in indigenous Nilotic cattle ranged from 85.3% to 99.2% with an average of 96.8%. Similarly, such a prevalence in the exotic Ankole breed ranged from 2.3% to 2.8% with an average of 2.5%. (fig. 2 and tab.1). However, the overall prevalence of fasciolosis in the study area was 17.0 % (790/4,642). In indigenous breed, the prevalence was high compared to the exotic cattle breed. Fasciola eggs were detected in 46 fecal samples of which 30.7% showed fasciolosis. Comparatively, Ankole cattle showed only 3 positive cases (2.9%) while Nilotic cattle had the majority of 43 cases (89.6%) as depicted in table 2.

3.2 Monetary Losses

Monetary loss due to condemnation of 251 out of 713 livers amounted to 45,180 South Sudanese pound (SSP) and 17,560 SSP for total condemnation and partial condemnation, respectively.

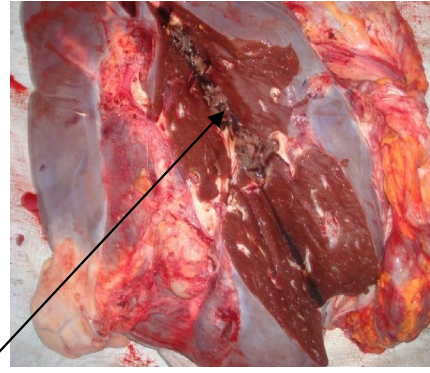


Figure 1: *Fasciola gigantica* in a bile duct of a condemned liver at Juba main S/House.

Table (1) : Prevalence of Bovine fasciolosis in indigenous Nilotic and exotic Ankole cattle examined at Juba main Slaughter House, May - July 2012.

| Month | Post-mortem Examination | | | | | | Total | |
|--------------|-------------------------|------------|---------------------|----------------|------------|---------------------|------------------------------|-----------------------------|
| | Ankole cattle | No. +ve | Prevalence % (Mean) | Nilotic cattle | No. +ve | Prevalence % (Mean) | No. of Cattle examined/month | Overall Prevalence % (Mean) |
| May | 1,273 | 29 | 2.3 | 198 | 169 | 85.4 | 1,471 | 13.5 |
| June | 1,316 | 37 | 2.8 | 264 | 257 | 97.3 | 1,580 | 18.6 |
| July | 1,340 | 34 | 2.5 | 251 | 249 | 99.2 | 1,591 | 17.8 |
| Total | 3,929 | 100 | | 713 | 690 | | 4,642 | |
| | | | 2.5 | | | 96.8 | | 17.0 |

Table (2) : Apparent prevalence of Bovine fasciolosis from fecal examination at Juba Slaughter House, May –July, 2012.

| Month | Fecal Examination | | | | | | Total | |
|--------------|-------------------|----------|---------------------|----------------|-----------|---------------------|------------------------------|------------------------|
| | Ankole cattle | No. +ve | Prevalence % (mean) | Nilotic cattle | No. +ve | Prevalence % (mean) | No. of cattle examined/month | Overall Prevalence (%) |
| May | 21 | 0 | 0.0 | 19 | 17 | 89.5 | 40 | 42.5 |
| June | 36 | 2 | 5.6 | 12 | 10 | 83.3 | 48 | 25.0 |
| July | 45 | 1 | 2.2 | 17 | 16 | 94.1 | 62 | 27.4 |
| Total | 102 | 3 | | 48 | 43 | | 150 | |
| | | | 2.9 | | | 89.6 | | 30.7 |

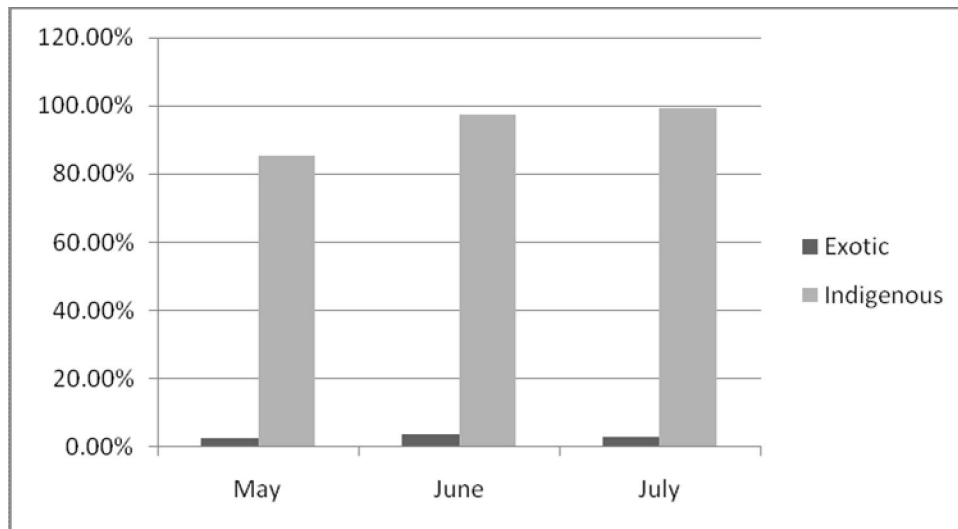


Figure 2: Monthly prevalence of *Fasciola gigantica* infection in Exotic(Ankole) and Indigenous (Nilotic) cattle during post mortem examination at Juba main S/House, May - July 2012.

4. Discussion

The significantly higher prevalence of Bovine fasciolosis in indigenous Nilotic than the exotic Ankole cattle breed might be attributed to lack of control strategy applied to fasciolosis for the past three decades besides inadequate veterinary services delivery system in South Sudan. This is exacerbated by the presence of permanent, extensive swamps in some areas and seasonal flooding of grazing land adjacent to swamps and rivers which collectively provide suitable habitats for snails in swampy areas. Moreover, humid, warm conditions in the main cattle-rearing areas of South Sudan are conducive for the survival of the aquatic snails that act as the intermediate hosts for *F.gigantica*. The significant low prevalence among the exotic Ankole cattle may be explained by de-worming regimens taken for the imported livestock in Uganda. Literature review indicated that the prevalence of fasciolosis in Uganda revealed 10% (Ozung *et al.*, 2011).

The high prevalence of bovine fasciolosis comparable to previous works done in the Sudan might be due to agro-ecological and climatic differences. In Ethiopia, Kenya Tanzania and Nigeria reports showed prevalence of 39.6%, 8.6%, 16.3% and 31.7%, respectively (Kithuka *et al.*, 2002; Ibrahim *et al.*, 2010; Malleu *et al.*, 2010 ; Ozung *et al.*, 2011). In Malakal, Upper Nile State, South Sudan, the prevalence of liver flukes in cattle revealed 37.0% (Eisa, 1963), who detected fluke eggs in 15.4% of cases in 365 cattle. Pathological lesion of the affected livers causes considerable loss. This economic loss is substantially higher than the average loss due to

fasciolosis in Ganawa slaughter house for 5 years which were 898,080 Sudanese Genieh (SDG) and 160 SDG at Al kadam slaughter house (Yasen, 2012). Scores of partial condemned livers revealed 63.6% which are greater than totally condemned livers (31.4%) indicating a continuous environmental contamination of infected snails in the vicinity of Nilotic cattle. The mechanical majority of the cattle inspected during the study have been hailed from Uganda suggesting that *F.gigantica* is the only species affecting cattle in Uganda. Similarly all cattle inspected at Juba main slaughterhouse suffered from *F.gigantica* infection and none was infected with *F.hepatica*. This may explain the exclusion of the latter in the epidemiology of bovine fasciolosis in South Sudan.

5. Conclusion

Fasciolosis is an important parasitic disease causing considerable loss of revenue due to condemnation of affected livers at Juba main slaughter house. Establishment of an effective control programme with regular treatment at 12-13 week intervals with flukicides is effective against both mature and immature flukes. This will eventually reduce and mitigate the intensity of infection in a herd over time and subsequent environmental contamination. Prospects for sustainable development of livestock need snail control and that should be added to the package of trematodes control aiming at *Fasciola* and other fresh water snails in South Sudan. Further studies on the molecular aspects and epidemiology covering a wider area, capturing all

seasons and involving large population of indigenous animals are needed for developing strategies for the control of fasciolosis in South Sudan.

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