ECONOMIC IMPORTANCE OF BOVINE FASCIOLIASIS IN NIGERIA

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SUMMARY

An attempt was made to determine the annual economic losses due to bovine fascioliasis in Nigeria. The estimates were based on an average annual disease incidence of 2.5%, an assumed mortality rate of 1%, a total liver condemnation rate of 7%, a cattle population of 10 million and an annual slaughter rate of 10%.

When the annual cost of treating and controlling fascioliasis amounting to N30,000 was added to other costs, total annual loss due to fascioliasis was estimated at some N5 million.$^3$ The importance of fascioliasis as a major source of production loss in the animal industry in Nigeria is discussed.

INTRODUCTION

It is increasingly evident that parasitism represents a major drawback to development in the tropics. However, a proper evaluation of economic losses due to various individual parasitic diseases is lacking. The assessment of losses due to parasitic disease is of great relevance to many tropical countries where economic realities often determine the type and scope of control measures envisaged.

Attempts have been made to assess the economic importance of bovine fascioliasis (Ross, 1970; Antonenkov, 1974; Bitakaramire and Okao, 1975). For instance, in the United Kingdom, it is estimated that fascioliasis accounts for an annual loss of about £50 million in milk and meat production ([CI, 1975). Although the importance of fascioliasis due to Fasciola gigantica on livestock production in Nigeria has been highlighted (Sewell, 1966; Dipeolu, 1975), proper economic evaluation of the disease has not been done. The difficulty of assessing economic losses due to chronic diseases is recognised. Hence the financial loss due to liver condemnation alone is often used in assessing losses due to fascioliasis (Hammond and Sewell, 1974). We have attempted to build a model for assessing economic losses due to bovine fascioliasis using other parameters which are often ignored. This simple model is based on available data and projected estimates.

METHOD OF ASSESSMENT

The economic losses due to bovine fascioliasis were assessed using a modification of the method of Antonenkov (1974) based on this formula:$^4$

$$E_L = N_D(P_A.B_w) + N_s(C_L) + N_e(D_w.P_A) + (C_s + C_t) + M_e$$

where

- $E_L =$ Estimated annual economic loss due to fascioliasis in cattle.
- $B_w =$ Average body weight of Nigerian cattle in kg.

$^3$ N1 = 60.85.

$^4$ If data were available, the formula could also be used in deriving annual economic loss due to fascioliasis in other domestic animals and total economic loss (E_D) could then be estimated.
\[
P_A = \text{Average market price of 1 kg beef}
\]
\[
N_D = \text{Number of animals that die of fascioliasis}
\]
\[
N_e = \text{Total number of animals chronically affected by the disease}
\]
\[
N_s = \text{Total number of animals slaughtered annually and positive for hepatic fascioliasis.}
\]
\[
D_w = \text{Difference in weight between healthy and diseased cattle}
\]
\[
C_L = \text{Mean cost of liver condemned at slaughter}
\]
\[
C_T + C_m = \text{Cost of treating and controlling fascioliasis}
\]
\[
M_e = \text{Miscellaneous costs}
\]

This formula is based on the established findings that fascioliasis leads to:

(i) Mortality in cattle directly in heavy infections or indirectly through predisposition to other diseases.

(ii) Chronic effects and, consequently, poor production performance.

(iii) Liver condemnation at slaughter.

(iv) Other effects (e.g. decrease in milk yield, decreased fertility, etc).

A. Mortality estimates

Fascioliasis occurs commonly as a chronic disease in cattle and the severity of the disease sometimes depends on the nutritional status of the host (Graber, 1971). However, acute losses have been recorded in cattle in East Africa (Coyle, 1958) and a herd mortality of between 25 and 30% was recorded in Northern Nigeria in heavy F. gigantica infections (Bogatko, 1975). Fascioliasis also predisposes to other infections, principally Clostridium, Salmonella and possibly blood parasites (reviewed by Ogunrinade, 1978). These indirect effects may additionally produce mortality. In the absence of mortality figures, we have assumed a low mortality rate of 1% of infected animals as a result of the direct and indirect effects of the disease. Total losses due to mortality \((N_D(P_A,B_w))\) then depend on the average carcass weight of Nigerian cattle estimated as 180 kg (FAO, 1966), the average market price of such cattle (₦350 or ₦1.94/kg)\(^8\) and the mortality rate as assessed above.

B. Annual disease incidence and cattle population estimates

Varying reports on the local incidence of fascioliasis in Nigeria appear in the literature (Ogunrinade, 1978). For instance, Babalola and Schillhorn van Veen (1976) reported a mean of 31.7% in Bauchi, Northern Nigeria, while 68% was reported in Savannah and Sahel zones (National Veterinary Research Institute, Annual Report, 1978). One of us (A.O., unpublished) has done a 5 year analysis of recorded cases of fascioliasis in 12 major abattoirs spanning all the climatic zones of Nigeria and recorded a mean annual prevalence of 2.5%. We have based our estimates on this latter figure.

Estimates of cattle population in Nigeria vary from 9.6 million (National Livestock Development Committee, 1971) to 11.6 million produced by the FAO (Olubajo, 1976). However, the figure of 10 million appears acceptable for most estimates. In using the latter figure, we have assumed a stable cattle population whose slaughter or death is replaced by natural birth and the cattle trade with neighbouring countries.

C. Annual cattle slaughter rate and cost of liver condemnation

Data on annual cattle slaughter rates are not available but it is assumed that about 10% of the total cattle population are slaughtered annually (Olubajo, 1976).

\(^8\) This price varies in different localities and according to market conditions.