

Impact of Trypanosomosis on Food Security in Nigeria: A Review

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Abstract: The aims of these review is to further highlight the direct and indirect impact of trypanosomiasis on food security in Nigeria. The direct impact on livestock productivity, include reduce meat and milk off take, calving rate, increase in calf mortality, decreases both lambing and kidding rates in sheep, goat and increase in cost of live stock management. Indirect impact of trypanosomosis include decrease crop production, decrease traction power, reduces work efficiency of both man and animals. The economic contribution of crop and animal production in ensuring food security in Nigeria is indispensable. Livestock production constitutes an important component of Nigeria agricultural development; animal protein raw materials for agro allied based industries. In conclusion, the potential for increasing livestock production can only be fully realized if the animals are adequately protected against the adverse effects of periodic stresses and diseases. Profitability of animal product demand efficient husbandry of animals, as disease remains a profit limitation factor in many tropical countries. For sufficient livestock production to be fully realized to meet the growing population of Nigeria, integrated approach to trypanosomiasis control is required to increase the present level of livestock production.

Key words: Agro based industries, crop production, economic impact, food security, livestock, trypanosomiasis

INTRODUCTION

Trypanosomiasis is a complex, debilitating, Zoonotic protozoon disease of man and animal (WHO, 1998). Tsetse transmitted African trypanosomiasis is found between latitude 14°N and 29°S covering 10 Million km² stretching across over 37 countries in Africa (Mulumba, 2003; WHO, 1998; Seifert, 1996). It is estimated that 60 million people and 48 million cattle are at risk of contracting Africa trypanosomiasis transmitted by 22 species and 33 sub-species of tsetse flies in Africa (Kristjason *et al.*, 1999; WHO, 1998; Seifert, 1996), Africa trypanosomiasis is responsible for 3 million livestock death and 55,000 people death annually in agriculture and mixed farming (Mulumba, 2003; Abenga *et al.*, 2003; ILRAD, 1990). About 35 million doses of trypanocidal drugs are administered annually in Africa (Geerts and Holmes, 1998).

In Nigeria, eleven of the twenty-two species of tsetse flies are known to infest over 80% of the 928,300km² of landmass, and are widely distributed from latitudes 4°N and 13°N in the country (NITR, 1989; Onyiah, 1997).

In Nigeria, the most important trypanosome species are *Trypanosomabrucei*, *T. congolense*, *T. vivax*, and *T. evansi* in livestock, while *T. gambiense* infect human.

The socio-economic impact of trypanosomiasis is extremely difficult to analyze, however losses have been estimated to amount to over 500 million US dollars in meat, milk, lost in traction power, and control programed (ILRI, 1997), There is also insufficient literature on the economic impact of the disease. The economic impact of trypanosomiasis in Nigeria can be assessed on direct and indirect effects.

RESULTS AND DISCUSSION

Review article in which several journals, books, Annual Reports, online journals and periodicals were consulted between 1989 to 2004 at the library of Nigerian Institute for Trypanosomiasis Research, Kaduna, Nigeria.

Aims and objectives:

- The aims of these review is to further highlight the direct and indirect impact of trypanosomiasis on food security in Nigeria
- To provide much needed information about the disease
- To provide information on the economic importance of the disease.

Direct and indirect effects: Trypanosomiasis has direct impact on livestock productivity, reducing meat and milk off take by 20%, calving rate by 20% increase, calf mortality by 20%, decreases both lambing and kidding rates in sheep and goat and livestock management especially the number of livestock kept by farmers, the breed and species composition of the livestock herd, the way the livestock are grazed, cost of trypanocidal drugs and cost of insecticides (Swallow, 2000). It also has direct impacts on human settlement in a considerable part of sub-Saharan Africa including Nigeria (Takele *et al.*, 1988). The main factors leading to changes in land use and land cover is migration. In an outbreak of trypanosomiasis that cause large losses in livestock numbers, people leave tsetse affected area to controlled area there by changes settlement patterns and increase population density of the area (Swallow, 2000; WHO, 1998). In a recent development, an outbreak of bovine trypanosomiasis in Lere district of Kaduna, North central Nigeria led to livestock deaths and seasonal migration of semi nomadic Fulanis of the Area (Abenga *et al.*, 2004). In the case of Human African trypanosomiasis, it reduces productivity of the people with the disease, family members who care for the ill and the rural residents who fear that they might contact the disease. Individual becomes burden to the family and the resources (WHO, 1998).

Indirect impact of trypanosomiasis mostly lies on crop production; through the availability and cost of animals that provide traction power (Swallow, 2000). Animal trypanosomiasis reduces work efficiency of Oxen for cultivation, reducing access to animal traction or discourages the introduction of drought animals in to crop farming (Omotainse *et al.*, 2004). Evaluation on effect of trypanosomiasis incidence on the productivity of oxen used for traction showed that relative inefficiency in the high risk area was 38% less efficient than oxen in the low risk area (Leak *et al.*, 1995; Swallow *et al.*, 1995). Additional traction capacity allows farmers expand the area that they cultivate, increase yield of existing crops; grow different mix of crops or allocated labour, land and fertilizer more efficiently.

Measures: African trypanosomiasis is of major economic importance due its effect on both man and his domestic livestock, especially cattle. The control strategies over the years have been directed against both the parasites and the vectors. These include surveillance and treatment, use of trypano-tolerant breeds and vector control (Seed, 2000; Barrett, 1997). The main approach to controlling the parasite in the host has been by chemotherapy and chemoprophylaxis Onyiah (1997). Trypanocidal drugs remain the principal method of animal trypanosomiasis control in most African countries Geerts and Holmes

(1998). The common trypanocides in use for treatment are Homidium bromide (Novidium), Isometamedium chloride (Samorin) and diaminazenediacetate (Berenil). Apart from the side effects of these drugs, the expensiveness and absence of new trypanocidal drugs leading to over dependence on the old drugs there is growing concern that there future effectiveness may be surely curtailed by wide spread drug resistance (Onyiah, 1997; Geerts and Holmes, 1998).

The phase of trypanosomiasis control focuses on the vectors. Current control measures depend on the application of relatively new, environmentally friendly insecticides including synthetic pryrethoid, daltamethrim and cypermethrim Seed (2000). These are applied from air by fixed or rotary wing aircraft, on the ground by backpack mounted a spray devises, or in ranch setting by allowing insecticide-treated cattle to served as target for live tsetse flies.

More recent control measure involves the use of sterile insect technique (Kamuanga, 2003; Seed 2000). The sterile insect technology, in combination with insecticide application is used successfully, but in only restricted geographical locations.

Additional control measure involves the use of indigenously designed traps and flags. The traps can be employed with or without the use of vector attractant.

The economic value of livestock to development of Nigeria to food security is indispensable. Livestock production constitutes an important component of Nigeria agricultural development. It provides animal protein requirement of the nation and vital product such as meat, milk, eggs, hides and skin and raw materials for agro-based industries (Majiyagbe and Lamorde, 1997).

From the available livestock statistics, Nigeria is abundantly endowed in animal population consisting of over 13.9 million cattle, 22 million sheep, 34 million goats and 3.4 million pigs (RIM, 1993). Records also indicate that beef, mutton and goat meat production between 1994 and 1995 averaged 127,000, 54,000 and 84,000 and 85,000 tones per year, respectively RIM, (1993). Beef intake is therefore most prominent, providing about 35-40% of the total animal protein intake. Research indicates that animal products contribute about 15-20% of the total protein intake of the nation (Shuaibu *et al.*, 1997).

It was estimated that the capital value of livestock industry in Nigeria was over N60 billion at prices with a contribution to the Gross Domestic Products (GDP) of more than 5% (Shuaibu *et al.*, 1997). A number of factors continue to militate against the attainment of food security in Nigeria by impacting negatively on the agricultural sector; among these factors is the disease and pest. Infestation of these continues to reduce gain of food and livestock production (Shuaibu *et al.*, 1997).

The occurrence of trypanosomiasis in Nigeria has directly affected the productivity of livestock population especially cattle, sheep, goats and pigs. As a result of devastating effect of the disease, animal protein output had not been able to match national demand, giving the fast population growth of about 3.5% as compared to 2.0% for livestock.

In Nigeria losses through animal diseases including trypanosomiasis range between 30-40% (Majiyagbe and Lamorde, 1997).

The economic loss due to trypanosomiasis is difficult to quantify however, estimate by the Nigerian institute for trypanosomiasis research between 1993 and 1996 in six States showed that losses in cattle alone amounted to N837.20 million annually. Onyiah (1997) further postulated that if trypanosomiasis is controlled or eradicated, tsetse infested areas of the country could support additional 2.5 to 3.2 times the current estimated livestock population.

CONCLUSION

In conclusion, the potential for increasing livestock production can only be fully realized if the animals are adequately protected against the adverse effects of periodic stresses and diseases. Profitability of animal product demand efficient husbandry of animals, as disease remains a profit limitation factor in many tropical countries. For sufficient livestock production to be fully realized to meet the growing population of Nigeria, integrated approach to trypanosomiasis control is required to increase the present level of livestock production.

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