

Management of Trypanosomosis in N'Dama Cattle

Studies on trypanotolerant N'Dama cattle in The Gambia identified alternative management approaches to the control of trypanosomosis and optimisation of productive, reproductive and draught power characteristics. These approaches included nutritional, chemotherapy and husbandry options. Adoption of these approaches (individually or in combination) is dependent on trypanosomosis risk.

Background

In many areas of Africa where tsetse flies are endemic, the availability of drugs for prophylactic control of trypanosomosis, a serious disease spread by the bite of the tsetse fly, is uncertain, and their cost is often prohibitive. Where they are available, their erratic use can lead to development of resistant strains of the trypanosome. Trypanotolerant breeds of cattle, such as the N'Dama, offer an alternative to smallholder farmers, but the productivity of these cattle, when infected, is often low or variable.

There is clear evidence that good nutrition increases the ability of cattle to tolerate infection through control of anaemia – an inevitable consequence of trypanosome infection. This means that infected animals can remain productive. However, responses to short-term nutritional interventions in field

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N'Dama cattle working in a groundnut field. Good nutrition increases the ability of trypanotolerant cattle to control trypanosomosis.

trials have been variable. It appears that animal productivity and the control of infection are associated with body condition and short-term liveweight change.

The development of feed systems, which promote disease control and productivity under different levels of tsetse challenge and physiological states, requires information on the interactions of body condition and short-term nutritional interventions.

Research highlights

Trypanosoma congolense-infected N'Dama cows, grazing native pasture and crop residues during the dry season in the Bondali district of The Gambia, suffered a 14% loss in live weight compared to an 8% loss in uninfected cows. Feeding 2 kg of groundnut hay as a supplement to the infected cows significantly reduced weight loss. The feed intake of draught N'Dama bulls changed in response to infection and the diet offered. Working and non-working animals receiving supplementary groundnut hay had significantly higher feed intakes, but this was reduced by infection. Working animals maintained feed intake during infection when the diet included a higher quality component such as groundnut hay.

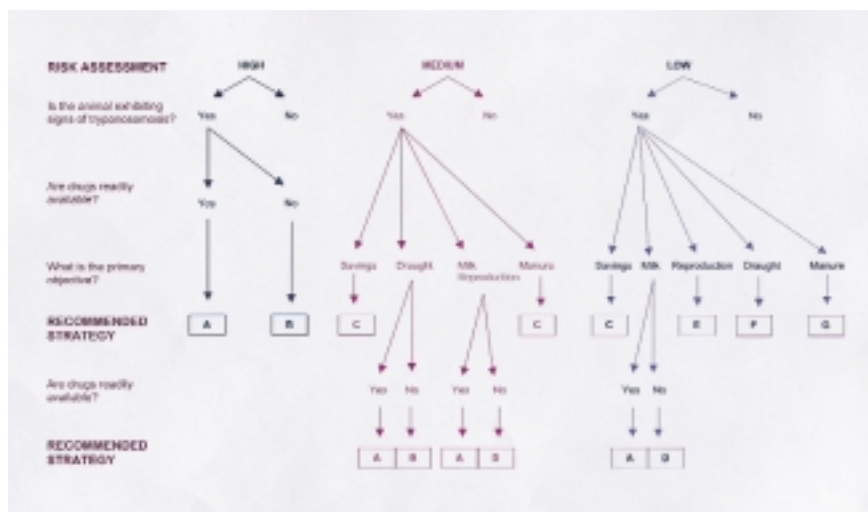
Forages alone had little effect on alleviating anaemia. However, the introduction of sesame cake to the diets of infected draught bulls significantly increased red blood cell replacement.

The project showed that nutrition influences the ability of N'Dama cattle to control the pathogenesis of trypanosomosis. Feed supplementation was shown to be a useful alternative to aid recovery of the disease where drugs are unavailable.

A simple technical package using a decision tree approach was produced (see overleaf). The package comprises a risk assessment exercise to determine management and feeding strategies for trypanosomosis control. The strategies are then reviewed in relation to the production objectives of local farmers.

Uptake

Although feed supplements alleviate weight loss in infected cows during the dry season, supplementation with better quality forages such as groundnut hay does not improve the working ability of draught N'Dama bulls in areas of high trypanosomosis challenge. Chemotherapy is, therefore, necessary when cattle become



Recommended strategies

- A Chemotherapy + protein supplementation
- B Removal from herd + high protein supplementation
- C No action for trypanotolerant breeds + protein supplementation if possible
- D Protein supplementation + chemotherapy if possible
- E Chemotherapy to reduce chance of abortion
- F Control amount of work and halt when signs of disease appear
- G No action necessary

Management strategy decision tree for three levels of trypanosomosis risk.

infected during the stressful working period.

Linkages

The project has generated sufficient information to enable livestock keepers to adopt appropriate strategies against trypanosomosis under different nutritional and physiological states. However, more disease/nutrition research is needed to develop cost-effective feeding and management systems to promote productivity of cattle, with and without disease. On-farm testing of the decision-making package, using extension staff to monitor the reactions of farmers and to provide feedback, is required. Promotion of N'Dama cattle in other parts of Africa with a high incidence of trypanosomosis is recommended. Related Livestock

Production Programme projects include R5184: Nutrition and genetic resistance in trypanotolerant cattle and R6140: Improving the performance of trypanosome-infected smallstock.

Relevance to sustainable livelihoods

The project demonstrated the importance of nutrition in the ability of N'Dama cattle to control trypanosomosis. Providing a higher concentration of protein in the diet during the acute phase of infection clearly improved the ability of the animals to control anaemia – improvements in the diet produced almost immediate benefits. Short-term responses to supplementation allow farmers to target individual animals showing acute symptoms of trypanosomosis, thereby making best use of scarce resources.

Cost-effective feeding and management programmes will increase productivity of cattle both with and without disease. This will greatly contribute to the improved sustainability of smallholder farming systems in tsetse-endemic areas of West Africa, where livestock are integrated into the farming system. Cattle have a number of uses in Africa, and improving their health will reduce mortality and hence improve smallholder income investments and capital.

Selected project publications

- Bennison, J.J., Clemence, R.G., Archibald, R.F., Hendy, C.R.C. and Dempfle, L. (1998) The effects of work and two planes of nutrition on trypanotolerant draught cattle infected with *Trypanosoma congolense*. *Animal Science*, **66** (3): 595–605.
- Bennison, J.J., Sherington, J., Wacher, T. J., Dempfle, L. and Leaver, J.D. (1998) Effects of *Trypanosoma congolense* infection and groundnut (*Arachis hypogaea*) hay supplementation on ranging activity and diet selection of N' Dama cows. *Applied Animal Behaviour Science*, **58**: 1–12.
- Bennison, J.J., Akinbamijo, O.O., Jaitner, J., Dempfle, L., Hendy, C.R.C. and Leaver, J.D. (1999) Effects of nutrition *pre-partum* and *post-partum* on subsequent productivity and health of N'Dama cows infected with *Trypanosoma congolense*. *Animal Science*, **68** (4): 819–829.

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