



RECOMMENDED VACCINATION SCHEDULE FOR CHICKEN

Age	Vaccine	Route of administration	Remarks
1 day old	<ul style="list-style-type: none">Mareks diseaseInfectious bursal disease (Gumboro)Newcastle disease and Infectious bronchitis	Subcutaneous for Mareks Aerosol spray	Given in commercial hatcheries
Day 10-12	Newcastle disease + infectious bronchitis	Drinking water	Booster vaccination
Day 18-21	Infectious bursal disease (Gumboro)	Drinking water	Booster vaccination
6 weeks	Fowl pox	Wing web jab	
8 weeks	Fowl typhoid	Intramuscular injection	
18 weeks	Newcastle disease vaccine	Eye Drop/drinking water	Every 3-4 months

- Note**
- Never vaccinate sick chicken
 - Consult your veterinary/ livestock expert for detailed program in your area.



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MANAGEMENT OF NAGANA AND SLEEPING SICKNESS



Introduction

African Trypanosomiasis is a zoonosis referred to as nagana and sleeping sickness in animals and humans respectively and whose control is effectively done by applying a One Health approach. Therefore, the collaboration between veterinarian's medical professionals and entomologists is required to sustainably control these diseases.

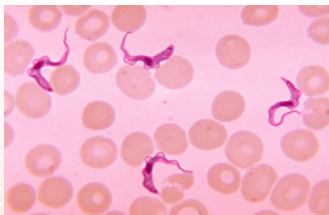
What is African nagana and sleeping sickness?

Nagana also called African Animal Trypanosomiasis (AAT) is a wasting disease caused by trypanosome parasites and affecting domestic and wild animals. Nagana is transmitted by the Tsetse flies thus follows its distribution in Sub-saharan Africa. Nagana is also transmitted mechanically by biting flies like stable fly (*Stomoxys*) and horse fly (*Tabanus*). The disease in camels referred to as "surra" is exclusively transmitted by biting flies. Livestock and wildlife are a source of trypanosomes (*T. b. rhodesiense* common in Eastern and southern Africa) and *T. b. gambiense* common in Central and West Africa) which cause sleeping sickness, the human form of the disease.

What causes nagana and sleeping sickness?

The two diseases are caused by blood parasites of the *Trypanosoma* spp.

Presence of *T. brucei brucei* in livestock is an indicator of circulating human infective parasites.



1Blood smear showing trypanosomes – source: Wikipedia

How livestock and people get infected

Nagana and sleeping sickness are transmitted by the bite of infected tsetse flies. Other biting flies like stable fly and horse fly are also known to transmit the disease. Sexual transmission is possible in horses especially *T. vivax* and *T. evansi*. *T. equiperdum* causing dourine in horses is sexually transmitted.



2 *Tsetse fly vector*



3 *Tabanid fly*

Signs and symptoms of the disease in livestock and humans

The major clinical signs of nagana in animals are: intermittent fever, anaemia, oedema,

Lacrimation, enlarged lymph nodes, abortion, decreased fertility, loss of appetite, body condition and productivity. Acute cases which may be fatal (eg hemorrhagic *T. vivax*) show extensive petechiation of the serosal membranes.



4 Healthy and sick cattle and camel in a trypanosomiasis endemic area



5 Camel suffering from trypanosomiasis

Humans

Progression of HAT has 3 stages: Cutaneous, Hemolymphatic, Central nervous system

- ✓ Cutaneous where a swelling develops at the site of inoculation within two days to two weeks of being bitten by an infected tsetse fly



Figure 6A chancre at site of tsetse fly bite – source: WHO

- ✓ Haemo-lymphatic stage is characterized by fever, headaches, enlarged lymph nodes, joint pains and itching
- ✓ Nervous stage manifests changes of behavior, confusion, sensory disturbances, staggering and disturbance of the sleep cycle (sleeping sickness). Coma and death are eventual outcome without intervention.

How is the disease diagnosed?

- ✓ Observation for clinical signs including swollen lymph nodes.
- ✓ Blood smear - to demonstrate presence of trypanosomes in stained blood smears or wet buffy coat for motile parasites.

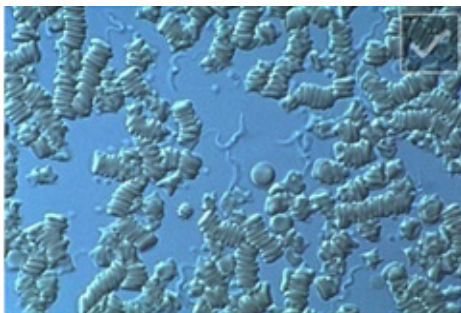
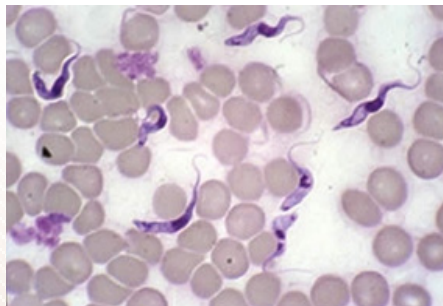


Figure 7 Trypanosomes observed in a Buffy Coat Smear- source: WHO

- ✓ Clinical examination in humans and analysis of the cerebrospinal fluid obtained by lumbar puncture
- ✓ Use of screening tests – serology to detect antibodies and Rapid agglutination tests to detect species-specific antigens
- ✓ Molecular techniques - Polymerase Chain Reaction (PCR)



8Laboratory diagnosis for trypanosomes



9Blood smear showing trypanosomes – source: Source MSD Veterinary Manual

How is nagana and sleeping sickness treated?

- ✓ Treatment in cattle;
- Clinical cases is treated using i) Berenil[®] (Diminazene aceturate), Veriben[®]; Diminasan[®] are effective against all trypanosomes species, and ii) Novidium[®](Homidium bromide or chloride); Ethidium[®])
- Prophylaxis is done using Samorin[®] (isometamidium chloride)
- ✓ In humans, first stage HAT is treated with **Pentamidine** and **Suramin**. Second stage is treated **Melarsoprol**, **Eflornithine**, **Nifurtimox** and their combinations. **Fexinidazole** is an oral treatment for both stages.

How do I Control Trypanosomosis?

- ✓ Chemoprophylaxis to prevent infection and enhance host resistance using prophylactic drugs like isometamidium chloride (Samorin[®] /Trypamidium[®], Merial; Veridium[®], Sanofi) in the tsetse belts



Figure 10 Samorin sachet for chemoprophylaxis

- ✓ Tsetse fly control by use of tsetse fly traps,-insecticide impregnated screens and targets, insecticide treated animals, bush clearing, and use of Sterile Insect Technique (SIT)



11 Biconical tsetse fly trap

Passive and active surveillance of the human population at risk for HAT to identify patients at an early stage and reduce transmission by removing their reservoir status

- ✓ Use of trypanotolerant animal breeds with innate resistance to trypanosomiasis such as the N'Dama and Orma Boran sustained in high tsetse density areas.



12 Trypanotolerant Orma Boran cattle



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