VII. SUMMARY

Investigations to monitor the dynamics of Tick-borne Diseases with special reference to ECF in calves and associations with management factors in Rukungiri District, Uganda.

In order to monitor the dynamics of East Coast Fever (ECF) -infection and -disease and to identify associations with different management factors of dairy calves in Rukungiri district in Uganda, a longitudinal study was carried out between June 1996 and June 1997 on 20 randomly selected farms. All calves up to 10 months of age present at the first visit and all newborn calves were investigated regularly during the study period. The study population consisted of 238 Friesian cross-bred and 43 indigenous (Ankole) calves. All animals were blood-sampled for serum once a month and clinically examined every fortnight. From animals meeting the case definition for clinically suspected ECF (febrile response ≥40°C, enlarged lymphnodes, disturbed general condition), blood and lymph node smears also were taken. For determination of antibody responses for *Theileria parva* the PIM recombinant antigen ELISA with a cut-off point of 15 PP% was carried out. All serum-samples furthermore were tested for *Theileria mutans*, *Babesia bigemina* and *Anaplasma marginale*. A standardised questionnaire to collect data on farm and herd management parameters, on tick control strategies (TCS) in particular, and to record information on ECF-histories of individual calves on the farm level was administered.

The overall seroprevalence for *Theileria parva* was 51.8%.

ECF infections on the individual calf level were strongly influenced by age, vector presence, breed and grazing management but only weakly affected by the quality of tick control and not at all by season.

Highest antibody levels were found in calves in the first month of age and lowest, after animals had lost their maternal antibodies, between the 3rd and 6th month of age. However, beyond 8 months of age the majority of animals had seroconverted.

Calves with engorged *Rhipicephalus appendiculatus* ticks had much higher ELISA values for *Th. parva* in almost all age groups than calves without ticks.

In regards to breed, higher serological responses for *Theileria parva* were found in Ankole calves than in cross-bred calves suggesting a higher risk for ECF-disease due to no or low acquired immunity. Consequently, the ECF case-fatality rate for crosses was 25.0%; no Ankole calf, in contrast, died of ECF. These differences in serological responses between both breed groups were accompanied with and related to different tick loads on them, being the result of different pasture use practices.
The results point to a strong association between sero-responses for *Th. parva* and the grazing system applied. Due to a permanent and much higher tick challenge under an open grazing system, significantly higher seroprevalences were found in calves older 3 month of age under this than under restricted grazing systems.

Relating ELISA results to clinical outcomes, it was shown that the majority (73.0%) of calves with clinical ECF reacted negative in the ELISA before disease occurrence. In chronic cases of ECF no antibodies were found until calves recovered, indicating a possible breakdown of the immune system. After recovery of clinically sick calves antibodies persisted in 87.5% of them for at least 4 month. In cases of fatal ECF, extremely low antibody values were detected prior to death.

ECF related calf morbidity was not affected by age, sex and breed but tended to be higher in local calves than in crosses, respectively in females than in males.

Calf herds were classified as having either "good" or "bad" management, based on classes of management parameters for tick control, health care, grazing management and herd size. Extremely low antibody titres for *Th. parva* were found for the "good" management class suggesting endemic instability under this system. Herds with "bad" management showed for cross-bred calves moderate and for Ankole calves high serological responses, indicating a different endemic situation for both breeds with an apparent stabile situation for Ankole calves in particular.

With a seroprevalence of 21.3% "benign" Theileriosis (*Th. mutans*) was the second most frequent TBDs-infection in the study area, followed by Anaplasmosis (*A. marginale*) with 16.9% and Babesiosis (*B. bigemina*) with only 5.0%.

Calculation of the proportional morbidity showed diarrhoea (35%) to be the most frequent disease followed by ECF (22%), eye problems (21%), lung affections (20%) and navel infections (2%).

ECF though accounted for most deaths (64%) when calculating the proportional mortality.

From the results it can be concluded, that the majority of cross-bred calves in Rukungiri district are obviously still highly susceptible to ECF. In order to prevent future losses the continuation of either intensive tick control always executed or the introduction of “ITM” with reduced tick control is highly recommended. However, all preventive measures in this breed-group has to be accompanied with an early and correct ECF treatment. For the local Ankole breed group it is obvious that any change of the current poor vector control practice would disturb the endemic stable situation for them.