

8 SUMMARY

The overall objective of this study was to identify and assess the disease risk factors constraining cattle productivity in Busia District, western Kenya, through a cross-sectional and a longitudinal disease survey.

During the cross-sectional disease study (November 2002), the prevalence of infections with trypanosomes, tick-borne disease parasites in cattle and faecal egg counts in calves were determined in the six divisions of Busia District. Results of the questionnaire indicated that farmers considered trypanosomosis, TBDs and helminthosis as the major constraints to productivity in cattle. Using the BCT, four types of trypanosome infections were detected (*T. vivax*, *T. congolense*, *T. brucei* as well as mixed infections) and the overall mean trypanosome prevalence in cattle was 4.7% (95% CI = 4.0-5.6). Trypanosome prevalence in cattle was significantly ($p < 0.05$) higher in Budalang'i and Funyula divisions than in other divisions. Adults and young stock had significantly higher trypanosome infections than calves. Free grazed and free grazed/tethered cattle had significantly higher trypanosome infections than either tethered or stall-fed animals. The overall mean prevalence of *Anaplasma*, *Babesia* and *Theileria* parasites in cattle was 16.4%, 4.8% and 6.9%, respectively. The prevalences of *Babesia* and *Theileria* parasites were significantly lower in Matayos and Township divisions than in other

divisions. The risk of infections with *Anaplasma* and *Babesia* was significantly higher in adults and young stock than in calves but this did not apply for infections with *Theileria* parasites. There were significantly more calves (70%) with high FEC compared to those (30%) shedding moderate to low numbers of faecal eggs. Compared to the other divisions, the risk of trypanosome and helminth infection was higher in Budalang'i and Funyula. The ages of animals and husbandry practices were significantly associated with the risk of infections with trypanosomes, helminths and TBD-parasites.

Based on the findings of the cross-sectional study, a longitudinal survey was designed in Budalang'i and Funyula divisions. Hence, 200 ear-tagged local Zebu and exotic/crossbred cattle stratified by breed and age, were purposively sampled from each division. Consequently, a total of 400 head of cattle (120 heifers, 120 calves and 160 adults) was selected. The animals were randomly assigned to 4 trial groups consisting of 50 (20 adults, 15 heifers and 15 calves) animals per group. Group I consisted of control animals, while Group II had animals treated prophylactically with isometamidium chloride at 1 mg/kg bw. Group III consisted of animals treated with albendazole 10mg/kg bw and Group IV had animals treated with albendazole at 10mg/kg bw and prophylactically with isometamidium chloride at 1 mg/kg. All treatments were repeated every three months during the 9-month follow-up study period. The mean hazard ratio of new trypanosome infections in Budalang'i and Funyula Divisions indicated that, untreated control animals were consistently at the highest risk of new infections followed by albendazole and then ISMM-treated animals. The risk of new trypanosome infections was lowest in the albendazole/ISMM treated animals. Results also revealed that the trypanosome infection rates of *G. pallidipes* were significantly higher than those of *G. fuscipes* implying that *G. pallidipes* had a higher vectorial capacity for animal trypanosomosis than *G. fuscipes*. With regard to infections with *Anaplasma* spp, treated animals, and local Zebus were significantly at a lower risk of infection compared to other animals. The risk of infection with *Anaplasma* and *Babesia* parasites also increased with age. For the infection with *Theileria* parasites, exotic/crossbred cattle had a significantly higher risk of infection than local Zebus. The shedding of FEC was significantly reduced by albendazole treatment. Calves had significantly higher FEC than any other age group. In addition, free grazed animals were also shedding significantly higher numbers of eggs than tethered and stall-fed animals. There were significantly more cows and heifers shedding

trematode eggs than calves. It was found that, trypanosome- and helminth-infections significantly reduced PCV of infected cattle. Single or combined albendazole and ISMM treatments resulted in significant improvements of PCV values. Trypanosome- and helminth-infections also significantly depressed weight gains in calves although helminth-infections were a much more important factor. Trypanosome- and helminth-infections were significantly associated with mortality in cattle. In calves however, helminth-infections were correlated with more deaths compared to trypanosome-infections. Abortions and stillbirths were restricted to untreated and albendazole treated cattle, implying that trypanosome infection significantly increased the rate of abortion in pregnant cows.

It can therefore be concluded that, trypanosome- and helminth-infections significantly constrain cattle productivity in Busia District, and that approaches to cost-effective disease management should avoid dealing with each disease in isolation, but rather employ an integrated approach.