AN INVESTIGATION OF FACTORS ASSOCIATED WITH THE PREVALENCE OF BOVINE COCCIDIOSIS AND ITS SPATIAL EPIDEMIOLOGY IN BUSIA, BUNGOMA AND SIAYA COUNTIES, KENYA.

Investigator: Dr. Dennis. N. Makau (BVM), J56/80896/2012.
Supervisors:
Prof. George. K. Gitau (BVM, MSc, PhD), Department of Clinical Studies, University of Nairobi.
Dr. Gerald .M. Muchemi (BVM, MSc, PhD), Department of Public Health Pharmacology and Toxicology, University of Nairobi.
Prof. Eric Fevre (BSc, MSc, PhD) ILRI.

Coccidiosis is protozoan infection that affects most domestic species. It is a serious condition with adverse effects on general health of various domestic animals. Infection is characterised by acute invasion and destruction of intestinal mucosa, diarrhoea, fever, anorexia, weight loss, emaciation and sometimes death (Coetzer and Justin, 2004). Bovine coccidiosis has a worldwide distribution (Coetzer and Justin, 2004) mainly affecting calves less than six months old and is associated with intensive management systems where hygiene is not well observed. Other stressors also predispose animals to outbreaks of the disease (Rodriguez, 1996). Munuya and Ngotho (1990) estimated the prevalence of bovine coccidiosis in Kenya at 67.4%. The overall objective of this investigation will be to determine the prevalence and spatial distribution of bovine coccidiosis, and associated factors within different production systems in Busia, Bungoma and Siaya counties Kenya. Specific objectives will be to determine the spatial distribution of coccidiosis and to assess the factors associated with coccidiosis in cattle in Busia, Bungoma and Siaya counties Kenya.

The three counties to be covered by the study have been selected based on convenience with regards to accessibility and logistical constraints. Households will be selected randomly using ArcMap software to generate random points (and a back-up for each random point). These random points will be entered into a GPS (Garmin Etrex) and the closest homestead -within 300 m -from the random point will be selected for sampling. The concept of the investigation will be introduced to the household and consent from the most responsible member sought. A questionnaire will be administered and clinical examination (of all cattle in the homestead) with sample collection followed by laboratory analysis will be done. A sample size of at least 380 cattle will be used for this study. Questionnaires will provide data on nutrition, seasons, housing, disease occurrence, veterinary attention, herd profile and use of the animals. Clinical examination will provide information on physiological status (lactating, pregnant), concurrent infections and presence other endo and ecto parasites. Faecal samples (least 5 gm) collected directly from the rectum via digital extraction using lubricated gloves will be stored in sealed plastic bags and labelled with bar code corresponding with the individual animal questionnaire. Samples will be transported to IDEAL field based laboratory in a cool box packed with ice for analysis. Coprological analysis will entail Kato Katz and Mc Master techniques. Spatial distribution of bovine coccidiosis in these counties will be analysed using ArcGIS 9.2 (ESRI, Redlands, CA) software. From this analysis a geographical view of the disease in relation to various geographical features will be presented in a point map. Clustering of disease in space will be evaluated using the Ripley’s K-function method using the formula (Pfeiffer et al., 2008).

R Statistical software will be used for descriptive and multivariable analysis of prevalence of coccidiosis in relation to various factors: geographical location, herd size, breed, level of
activity, age, gender, physiological status. Generalized mixed model regression will be used to model disease (coccidiosis) as outcome and breed, level of activity, age, gender and physiological status (lactating, pregnant), herd size, management geographical location, and concurrent infections/disease conditions as explanatory variables. Confounding will be controlled for during analysis.

This study will provide information on the spatial prevalence of bovine coccidiosis in western Kenya which will be presented as a point prevalence map. Moreover information on geographical and environmental factors associated with the disease in western Kenya will be obtained and can be extrapolated to other areas in Kenya.