ANALYSIS OF BOVIGAM AND TUBERCULIN TESTS IN DETECTION OF BOVINE TUBERCULOSIS IN CATTLE IN LAIKIPIA COUNTY AND ASSOCIATED RISK FACTORS

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ABSTRACT

Bovine tuberculosis (BTB) is an infectious disease of cattle caused by the bacterium *Mycobacterium bovis* which can also infect and cause tuberculosis in other mammals including goats, pigs, dogs and cats. The disease is an important zoonosis worldwide that has been emerging and re-emerging in different ecological scenarios. Amongst livestock the disease is most commonly associated with cattle and has a large economic significance. As a zoonotic disease, bovine tuberculosis is also a threat to public health where consumption of infected unpasteurized milk and other dairy products can be a source of human infection. However, exposure to aerosols containing *Mycobacterium bovis* is also likely to be an important risk factor for bovine tuberculosis in humans. Despite huge global efforts in tuberculosis control, pastoral areas remain under-investigated. Bovine tuberculosis has been extensively studied in countries neighboring Kenya. Little research has been done in Kenya concerning bovine tuberculosis and yet the disease causes major economic losses on animal productivity and human transmissions constitute a major public health concern. This study aims at detecting bovine tuberculosis in live cattle in Laikipia County by use of comparative intradermal tuberculin and bovigam tests and then compare results obtained from the two methods. This will involve sampling a total of 753 cattle from the sampling sites (Laikipia North, East and South). Animals aged six months and older will be selected for sampling. Ear tags and nail vanish will be used to identify test animals. The animal will then be shaved using a scapel two areas of 2 cm, 12 cm apart at the mid neck region of the animal. The thickness of the skin will be measured with a digital calliper and disinfected with 70% ethanol. Four (4) mls of venous blood will then be drawn from the animal after shaving and disinfection of the area in a vacutainer containing heparin, packaged in temperature controlled delivery boxes. 0.25 ml of the blood will be inoculated with 25 µL bovine and avian purified protein derivatives and incubated at 37°C overnight within 24 hours of collection. Plasma supernants will then be harvested after incubation, stored at -20°C and then transported to the laboratory for quantification with sandwich ELISA using the commercially available BOVIGAM® Plate Kit. Intradermal injection of 0.1 ml (2,500 IU/ml) bovine purified protein derivative and 0.1 ml (2,500 IU/ml) avian purified protein derivative will be made in two shaved sites. In young animals in which there will be no room to separate the sites sufficiently on one side of the neck, injection shall be made on each side of the neck at identical position in the centre of the middle third of the neck. Skin thickness will be measured again at both injection sites after 72 hours. The reaction at each site will be derived as the difference of the skin thickness after 72 hours minus before injection. Data will be analysed by Statistical Package for Social Science software utilizing Chi-square analysis to test for rates of reactors according to study site, breed, sex, age and herd size obtained from comparative intradermal tuberculin test and bovigam (interferon gamma test). Descriptive analysis will be utilized where applicable. The findings from this study will be important as they will shed light on the presence of bovine tuberculosis in live cattle.

ACRONYMS AND ABBREVIATIONS

BTB	Bovine tuberculosis
OIE	World Organization for Animal Health
WHO	World Health Organization
CDC	Center for Disease Control
CITT	Comparative Intradermal Tuberculin Test
PPDs	Purified Protein Derivatives
PPDB	Bovine Purified Protein Derivative
PPDA	Avium Purified Protein Derivative
IFN-γ	Interferon gamma
CMI	Cell Mediated Immune Response
ELISA	Enzyme Linked Immunosorbent Assay
BSA	Bovine Serum Albumin
PBS	Phosphate Buffered Saline
OD	Optical Density