SERO EPIDEMIOLOGICAL STUDIES ON BOVINE BRUCELLOSIS IN SRI LANKA USING ENZYME LINKED IMMUNOSORBENT ASSAY (ELISA) TECHNIQUE

A thesis submitted by

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ABSTRACT

The overall weighted sero prevalence of bovine brucellosis in Sri Lanka was 5%. The sero prevalence of bovine brucellosis varied from 0% to 33.3%. Zero prevalence was observed in three districts, namely, Badulla, Kegalle and Galle. Higher prevalence ($\geq 6.2\%$) was observed in 5 districts namely, Puttalum, Nuwara Eliya, Anuradapura, Ampara and Hambantota. The data were obtained by blood sampling and testing 4479 cattle and buffaloes from private sector herds in 102 Divisional Secretariat Areas (DSAs) in 23 districts using stratified random sampling technique. The results obtained from bovines in Kilinochchi, Jaffna, Batticoloa, Trincomalee and Vavuniya districts cannot be considered as accurate due to inadequate sample size.

The findings herein describe the advantages in using the Enzyme Linked Immunosorbent Assay (ELISA) to calculate epidemiological data when the prevalence of a disease is low because of high sensitivity of ELISA. The ELISA was able to detect the potential spreaders of brucellosis, when Complement Fixation Test (CFT) and Rose Bengal Test (RBT) failed. It was shown that the specificity of CFT and RBT relative to ELISA was also low, in detecting *B. abortus* antibodies in serum. A bovine was identified as a serologically negative reactor for brucellosis when it had an antibody titre of less than 32 ELISA units (EU), suggesting that the animal had not been exposed to the *B. abortus* bacteria. However, in vaccinated bovines, a titre of less than 64 EU, was recognised as a result of an ineffective vaccination. Cattle in enterprise farms which were vaccinated with S19 were significantly positive for *B. abortus* antibodies than

unvaccinated cattle. None of the vaccinated buffalo were positive for *B. abortus* antibodies.

The contributory factors associated with prevalence was identified by calculating the odds ratio (OR). The sero positivity significantly increased with increasing age since older animals had a greater chance of exposure to infection than young animals. Intensive and extensive management systems were positively associated with sero prevalence. Higher prevalence in intensive management system was most probably due to improper practices. In extensive management systems, the prevalence was significantly high due to the increased possibility of contact between animals out in the field. Animal management system practised at various locations was based on climate. Dry Zone Low Country and Wet Zone Up Country agro climatic zones were associated with higher prevalence since the extensive and intensive management systems, respectively, were practised in those zones. Lastly, greater prevalence was associated with greater stock densities. The above information will greatly assist a bovine brucellosis control or eradication program in the various geographical or agro climatic division in the country.