PREFACE

India is the world’s largest producer of milk. In 2003-04 India produced 850 million tons of milk. India tops in cattle wealth in the world. 15% of the world’s cattle and 57% of buffaloes are in India. The total number of the cattle in India as per the census of 2003 is 185 million and 98 million buffaloes. In Tamilnadu, as per the 126th livestock and poultry census 2000, the total cattle population is 93.63 lakh, which accounts for 35.8% of the total livestock population in the country. Cattle are raised as dairy animal for milk and other dairy products, as livestock for meat (beef) and as draft animals (pulling carts, plough). Other products include leather and dung for manure or fuel. So cattle should be protected from bacterial and viral diseases to increase the economic status of a country. In egg production India ranks fifth in the world. In livestock and poultry farm, animals should be vaccinated to protect from diseases.

The thesis is organized as follows,

Chapter one namely Vaccination – Facts and Importance deals with the importance of vaccines. It also describes history of vaccination, types of vaccination and immunity developed by vaccination.

Animal diseases – of all origin is discussed in chapter two. Bacterial, viral, fungal, parasitic and hereditary diseases of animals are discussed.
Chapter three is organized to explain the theory and practice of Fourier Transform Infra Red (FTIR) and UV-Visible Spectroscopy. In detail the infrared spectroscopy and its applications are given. The basics and the importance of both FTIR and UV-Visible Spectroscopy are discussed.

Chapter four deals with the study of Bacterial animal vaccines. This chapter also deals with the disease anthrax and the effect of anthrax spore vaccine on animals. It explains the effect of ASV on animals both at laboratory level and at field level also. The blood samples are collected from goat, white calf, sheep and cattle before and after vaccination. The period of study starts on the zero day i.e before vaccination and continues upto the 7th day, 14th day and 21st day after vaccination. The blood samples collected on these days are subjected to FTIR and UV-Visible spectral analysis. The results obtained are discussed in detail.

Chapter five deals with the effect of Haemorrhagic Septicaemia Vaccine (HSV) on cattle in the field level. FTIR and UV-Visible spectral analysis are done on the blood samples collected from cattle in the field level before and after vaccination with HSV. The results obtained are discussed in detail.

Chapter six explains the effect of Black Quarter Vaccine (BQV) on cattle at the field level. Blood samples are collected from cattle in field level before and after vaccination. The collected blood samples are subjected to
spectral analysis namely FTIR and UV-Visible spectral analysis. A detailed discussion is done on these results.

Chapter seven explains the study of viral animal vaccines namely Foot and Mouth Disease Vaccine (FMDV) and Ranikhet Disease Vaccine (RDV). The study of FMDV is conducted using cattle at the field level. The samples collected are used for FTIR analysis. The results are discussed. Ranikhet disease vaccine is injected to chicks and blood samples are collected. The effect of the vaccine is studied through FTIR analysis. The results obtained are recorded and discussed.

The chapter eight by name summary and conclusion records the findings of all the work done. This work is planned in such a way that it reflects all factors namely both bacterial and viral animal diseases are taken for the study. The studies are conducted at laboratory level and at field also. In this chapter the importance of employing spectroscopy as a diagnostic tool to find out the effect of veterinary vaccines on animals is discussed.