VI. SUMMARY

The efficacy of a live r-BCG, BCG vaccine and recombinant DNA was tested in a group of calves from herds with known negative tuberculosis status. For the purpose of the evaluation of rDNA, rBCG & BCG vaccines in calves, five groups of 8 calves each, aged approximately 3-6 months, were injected intramuscularly with 1000ug of recombinant-DNA expressing Rv3881c protein and subcutaneously with 1x10^6 CFU of r-BCG and conventional BCG vaccine. A control group received PBS via the subcutaneous route and vector control group received intramuscularly 1000ug of plasmid Pjw4303 used as vector for rDNA vaccine. Primary and booster vaccinations on 30 days after first injection with recombinant DNA and Primary vaccinations with BCG were administered to 8 calves, while another 8 were left unvaccinated as control animals.

A Total of 2668 animals from fifteen private and government dairy farms were screened for incidence and percentage of incidence was only 2.41%. Among different breeds, Holstein cross bred animals were shown 3.8% of incidence compared to Jersy cross bred (0.63%) and Local breed (0%). Similarly, the percentage of incidence was 3.26% in female when compared 0.48% in male animals.
The cell mediated (Th-1) immune status was monitored using the interferon-gamma assay. Flowcytometry study of CD4 and CD8 T-cells and humoral (Th-2) immune response by Cytokine IL-4 capture ELISA. Laboratory tests were able to distinguish between infected and non-infected animals from an early stage. The immune status scores of individual animals were generally much higher in the rBCG and BCG vaccine study than what was experienced with the rDNA vaccine and control Model.

In the gamma interferon assay, the difference in the PP values of sera collected from control and rDNA vaccinated calves after 120 days and 150 days was highly significant (P<0.001), and it was non-significant after 0, 30, 60 and 90 days (P > 0.05). Whereas, PP value difference in sera collected from Control and rBCG vaccinated calves was highly significant (P < 0.001) after day 30, but the difference in PP value was highly significant on day 60 and 90th day (P<0.001) and was significant on day 30 in sera collected from conventional BCG and rBCG vaccinated calves.

In the flowcytometry assay, the difference in the PP value of CD4 cells produced in rDNA vaccinated calves and control calves was significant only on 150th day (P<0.05), and moderately significant on 120th day (P<0.01) and non-significant on 0, 30, 60 and 90th day. Whereas, the difference in PP value of CD8 cells produced in control and
rDNA vaccinated calves was non-significant on day 0, 30, 60, 90, 120 and 150 (P>0.05). Similarly, the difference in the PP values of CD4 cells produced in control and rBCG vaccinated calves was significant on 90th day (P<0.05), but the difference of PP value of CD4 cells in control and conventional BCG vaccinated calves was significant only on day 90 (P<0.05). But PP value difference of CD4 cells in control and conventional BCG vaccinated calves was non-significant on day 0, 30, 60 and 90 (P>0.05). Whereas, the pp value difference in CD8 cells production in BCG and rBCG vaccinated calves was significant on day 60 and non-significant on day 0, 30 and 90 (P >0.05). The difference in pp values of mixed cells production in all group was non-significant on all collections. In the cytokine IL-4 capture ELISA, the pp values of serum sample collected at 0, 30, 60, 90, 120 and 150th day. Analysis showed that the difference in the PP values of sera sample on 0, 30, 60, 90, 120 and 150th day from control, vector and rDNA vaccinated calves was non-significant (P>0.05).

The differences between immune response between the DNA and BCG vaccine study groups were significant and it can be concluded that under the prevailing conditions the rBCG vaccine was able to show higher immune responses compared to conventional BCG vaccine and rDNA vaccines in calves against the Bovine tuberculosis.