ABSTRACT

RESPONSE OF WATER BUFFALO (*BUBALUS BUBALIS*) TO EXPERIMENTAL CHALLENGE WITH *BRUCELLA ABORTUS* BIOVAR 1 FOLLOWING VACCINATION WITH TWO DOSAGES OF *BRUCELLA ABORTUS* STRAIN RB51.

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The study was conducted to determine the efficacy of *Brucella abortus* strain RB51 vaccine in preventing abortion in pregnant water buffalo (*Bubalus bubalis*) experimentally challenged with a local pathogenic strain of *B. abortus* biovar 1. No commercially available *Brucella* vaccine has been reported to have proven efficiency in water buffalo. Bacteriological, serological, and pathological studies were also conducted on study animals. Thirty-two female water buffalo calves aged six to ten months, were obtained from two brucellosis-free herds and were randomly divided into three groups. Group I animals received approved dosages of RB51 vaccine twice four weeks apart, Group II were vaccinated twice eighteen weeks apart and Group III (control) received saline. All inoculations were done by the subcutaneous route. Pre- and post-vaccination blood samples were collected and tested for *B. abortus* immunoglobulins using the buffered plate agglutination test (BPAT), RB51-complement fixation test (RB51-CFT), dot-blot assay, and for cell-mediated immunity, using the gamma interferon assay. Immune responses were monitored up to forty-eight post-vaccination weeks (PVW).

At selected intervals, lymph nodes were excised from randomly chosen study animals representative of the three groups and subjected to bacteriological examination. All water buffalo heifers were pasture-bred and challenged intravenously with 2.0 – 3.5 x 10^8 colony forming units (CFU) of a local pathogenic strain of *B. abortus* biovar 1 at approximately 180 days of pregnancy. Animals were observed for abortions or still births; and tissue samples were collected to determine the frequency of isolation of *B. abortus* from both aborting and non-aborting animals and in aborted calves.

RB51 vaccination did not induce antibody response detectable by conventional assay test (BPAT). The RB51-CFT and dot-blot assay detected antibody responses as early as 1 post-vaccination week (PVW) and both tests had high sensitivity (94%, 95%) and high specificity (100%, 100%) respectively. Killed RB51 cells, used as the stimulating antigen, produced significantly ($P<0.05$) higher levels of gamma interferon for Group II animals than detected from commercially available 'Brucellergene'. The frequency of detection (sensitivity) using the standard USDA National Veterinary Services Laboratory media or Kuzdas and Morse media in isolating *B. abortus* RB51 from lymph nodes were not significantly different ($P>0.05$).

The mean ± sd number of post-challenge days for abortion or normal delivery were: Group I – 111.8±31.4, Group II – 98.1±28.6 and Group III (Control) 101±36.5. There was no statistically significant ($p = 0.670$) difference in the means for the three groups. The frequency of abortion, stillbirth and early neonatal death in seropositive dams were 62.5% (5 of 8), 60.0% (3 of 5) and

66.7% (2 of 3) for Group I, Group II and Group III study animals respectively (P>0.05). Data from this study demonstrated that vaccination of water buffalo calves using two dosages of *B. abortus* RB51 vaccine did not protect pregnant animals from abortion, still births or early neonatal deaths following intravenous challenge with 2.0-3.5 x 10^8 CFU of a pathogenic strain of *B. abortus* biovar 1.