

## Field Safety Evaluation of Titanium<sup>®</sup> 5 L5 HB Vaccines in Pregnant Cows

Titanium Study No. 02-11 Revision No.1

Elanco

Titanium

### Study overview

The safety of Titanium 5 L5 HB in preconditioned pregnant heifers and cows was evaluated by comparing outcomes of cattle vaccinated with Titanium 5 L5 HB during the first, second or third trimester of pregnancy, with control groups not receiving a vaccine during pregnancy. All cattle in the study were vaccinated with the Titanium 5 L5 HB prior to breeding.

### Key study results

Live calf rates in the vaccinated groups were comparable to the rates among control groups not receiving the vaccine during pregnancy (Figure 1).

### Background information

#### TRIAL DESIGN

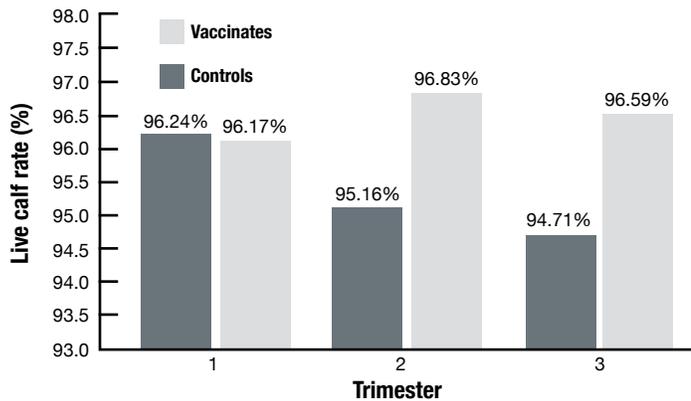
- Total head — 1,460 pregnant heifers and cows at three locations
- Prior to breeding, all animals were vaccinated with Titanium 5 L5 HB, a combination vaccine containing modified-live virus (MLV) infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD) virus types 1 and 2, parainfluenza virus<sub>3</sub> (PI<sub>3</sub>), and bovine respiratory syncytial virus (BRSV)
- Test subjects were vaccinated during the first, second or third trimester of pregnancy with Titanium 5 L5 HB. Control cattle were not vaccinated during pregnancy
- Pregnancy stage was confirmed by transrectal ultrasonography
- Animals were managed according to standard procedures of each study site, and had continuous access to feed and water
- Throughout the study periods, animals were monitored daily for abortions and other adverse events
- Abortion rates and live calf rates in test animals were compared with those of the controls
- Injection sites were observed daily for 14 days post-vaccination for reactions, including injection-site swellings or abscesses, and systemic reactions, such as lameness, anorexia and depression

#### MATERIALS AND METHODS

- **Site 1:**
  - 422 cows in the first trimester of pregnancy were enrolled in the study on Day 0 and were randomly divided into two groups
    - Cows in group 1 (n = 213) served as untreated controls and were not vaccinated during pregnancy
    - Cows in group 2 (n = 209) were given a single subcutaneous (SQ) injection of Titanium 5 L5 HB on Day 0 of the study
    - Animals found not to be pregnant at Day 77 were recorded as having aborted
- **Site 2:**
  - 625 cows in the second trimester of pregnancy were enrolled in the study on Day 0 and were randomly divided into two groups
    - Cows in group 1 (n = 310) served as untreated control and were not vaccinated during pregnancy
    - Cows in group 2 (n = 315) were given a single SQ injection of Titanium 5 L5 HB on Day 0 of the study
    - Cows that did not deliver a live calf up to the time of parturition were counted as abortions
- **Site 3:**
  - 413 cows in the third trimester of pregnancy were enrolled in the study on Day 0 and were randomly divided into two groups
    - Cows in group 1 (n = 208) served as untreated control and were not vaccinated during pregnancy
    - Cows in group 2 (n = 205) were given a single SQ injection of Titanium 5 L5 HB on Day 0 of the study
    - Cows that did not deliver a live calf up to the time of parturition were counted as abortions

## Study results

Figure 1. Titanium 5 L5 HB effect on live calf rates



- No pregnancy losses could be attributed to any etiologic agent following administration of Titanium 5 L5 HB to pregnant cattle during the first, second or third trimester

## Key findings

- Vaccination of pregnant heifers and cows with Titanium 5 L5 HB caused no risk to pregnancy among animals vaccinated with the same MLV vaccine prior to breeding
- Abortion and live calf rates were similar among those animals vaccinated prebreeding and during pregnancy with field-dose levels of the same MLV vaccine, and those not vaccinated during pregnancy

The label contains complete use information, including cautions and warnings. Always read, understand and follow the label and use directions.

Do not vaccinate within 21 days of slaughter.

