

## ReproSTAR® L5 HB

Leptospira Canicola-Grippotyphosa-Hardjo-Icterohaemorrhagiae-Pomona Bacterin

## ReproSTAR® VL5 HB

Campylobacter Fetus-Leptospira Canicola-Grippotyphosa-Hardjo-Icterohaemorrhagiae-Pomona Bacterin

### Reproductive protection

- Protects against five strains of lepto, including *L. hardjo-bovis* and vibrio when ReproSTAR VL5 HB is used

### Contains U.S. isolate of *Lepto hardjo-bovis*

- *L. hardjo-bovis* is the most common cause of bovine leptospirosis in U.S. cattle<sup>1</sup>
- *L. hardjo-bovis* antigen was isolated from a reproductive disease outbreak in a dairy herd in Oregon
- Is geographically distinct from Spirovac®, which contains an isolate from Australia<sup>2</sup>

### Long-lasting protection

- Xtend® SP adjuvant technology provides prolonged stimulation of the immune system

### Safe for pregnant animals

- Safe for all cattle, including pregnant cows

## ReproSTAR® L5 HB

INDICATIONS: For use in healthy cattle as an aid in the prevention of disease caused by *Leptospira canicola*, *grippotyphosa*, *hardjo-bovis*, *icterohaemorrhagiae* and *pomona*.

ADJUVANT: Xtend® SP

DIRECTIONS: Shake well before using. Administer 2 mL subcutaneously. In accordance with Beef Quality Assurance guidelines, this product should be administered subcutaneously (under the skin) in the neck. Repeat in 4-6 weeks. Revaccinate annually or as recommended by your veterinarian.

PRECAUTIONS: Store out of direct sunlight at 2°-7° C (35°-45° F). DO NOT FREEZE. Use entire contents when first opened. Do not vaccinate within 60 days prior to slaughter. Transient swelling may occur at the site of injection. Milk reduction and transient depression may be observed in lactating dairy cows for 3-6 days following vaccination. Anaphylactic reactions may occur. Symptomatic treatment: Epinephrine. Contains thimerosal as a preservative.

## ReproSTAR® VL5 HB

INDICATIONS: For use in healthy cattle as an aid in the prevention of disease caused by *Campylobacter fetus*, *Leptospira canicola*, *grippotyphosa*, *hardjo-bovis*, *icterohaemorrhagiae* and *pomona*.

ADJUVANT: Xtend® SP

DIRECTIONS: Shake well before using. Administer 2 mL intramuscularly 2-4 weeks prior to breeding. Revaccinate in 4-6 weeks with ReproSTAR L5 HB. Revaccinate annually or as recommended by your veterinarian.

PRECAUTIONS: Store out of direct sunlight at 2°-7° C (35°-45° F). DO NOT FREEZE. Use entire contents when first opened. Do not vaccinate within 60 days prior to slaughter. Transient swelling may occur at the site of injection. Milk reduction and transient depression may be observed in lactating dairy cows for 3-6 days following vaccination. Anaphylactic reactions may occur. Symptomatic treatment: Epinephrine. Contains thimerosal as a preservative.

### Product Numbers

**ReproSTAR® L5 HB**  
403 - 20 mL - 10 doses  
404 - 100 mL - 50 doses



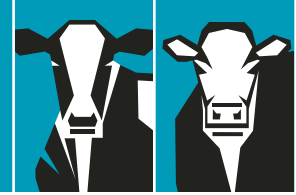
### Product Numbers

**ReproSTAR® VL5 HB**  
366 - 20 mL - 10 doses  
367 - 100 mL - 50 doses



### Customer Service (800) 843-3386

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# Technical disease information

## Leptospirosis

In North America, the most common cause of bovine leptospirosis is *L. borgpetersenii* serovar hardjo (Type: *hardjo-bovis*).<sup>1</sup> Research shows that *hardjo-bovis* is the most common host-adapted U.S. serovar and is most frequently associated with reproductive losses,<sup>3</sup> although an infected animal often will not show clinical signs.

Because infection is generally subclinical and produces low antibody titers,<sup>3</sup> diagnosing a host-adapted infection can be difficult. Once a host animal is infected with *L. hardjo-bovis*, the organism colonizes in the kidneys<sup>4</sup> and reproductive tract, where it causes reproductive problems such as conception failure and early embryonic death.

The most economically significant result of *L. hardjo-bovis* is persistent infection, because the bacterium lives in the kidney of carrier animals and is spread through the urine to other animals. *L. hardjo-bovis* can be extremely costly for dairy and beef producers, due to significantly lower conception rates and early embryonic deaths. The pathogen may be transmitted during breeding, as well as from cow to fetus. Calves may be born as congenitally infected maintenance hosts.

**ReproSTAR L5 HB** and **ReproSTAR VL5 HB** contain an *L. hardjo-bovis* isolate that originates from a U.S. problem herd. The isolate is geographically distinct from the isolate in Spirovac®, which originated in Australia.<sup>2</sup>

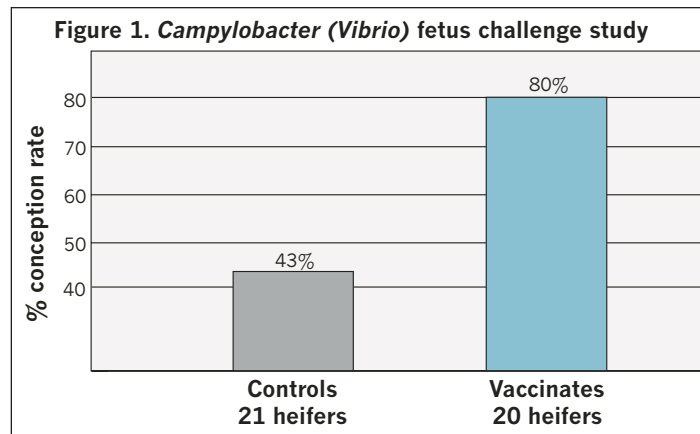
*L. pomona*, for which cattle are an incidental host, is also associated with significant reproductive problems. Affected animals are more likely to show clinical signs of disease and are easier to diagnose. Clinical signs of leptospirosis in incidental hosts can include abortion, typically between four and seven months of gestation; birth of premature and weak calves; milk drop syndrome; and severe kidney and liver disease.

## Campylobacteriosis

Bovine genital campylobacteriosis, previously known as vibriosis, is a venereal disease of cattle caused by *Campylobacter (Vibrio) fetus*. This disease is spread from bull to cow and cow to bull during breeding. It can also be spread through artificial insemination if pipettes or semen are contaminated.

The presence of the disease should be suspected when conception rates for a herd drop below 90 percent. Definite diagnosis can be made by identifying the organism in the mucus from the cow's reproductive tract or in preputial fluid from the infected bull.

Research shows that vaccination with the vibrio component of **ReproSTAR VL5 HB** can improve conception rates.<sup>5</sup> In a severe pre-breeding challenge, nearly twice as many heifers became pregnant in the vaccinated group as shown in **Figure 1**. These animals were challenged with two different strains of *Campylobacter fetus*.



1. Zuerner RL, et al. Repetitive sequence element cloned from *Leptospira interrogans* serovar hardjo type hardjo-bovis provides a sensitive diagnostic probe for bovine leptospirosis. *J Clin Microbiol.* 1988;26:2495-2500.  
 2. Novartis makes no claims concerning the superiority of the U.S. isolate in ReproSTAR to the Australian isolate in Spirovac.

3. Hairgrove T. Leptospirosis in cattle. *AABP Proceedings.* Vol. 37. Sept. 2004.  
 4. Orr HA, Little TW. Isolation of *Leptospira* of the serotype hardjo from bovine kidneys. *Res Vet Sci.* 1979;27(3):343-346.  
 5. Data on file, Novartis Animal Health US, Inc.