

Brucella abortus Strain RB51 Vaccine Licensed for Use in Cattle

Bovine brucellosis, caused by the bacteria *Brucella abortus*, in cattle and farmed bison is a serious and contagious livestock disease that has significant animal health and public health consequences. USDA and its partners established a cooperative State/Federal Brucellosis Eradication Program more than 50 years ago to eliminate the disease from the United States. As a result of this program, all 50 states, Puerto Rico and the U.S. Virgin Islands are considered Brucellosis Class Free. States are not required to vaccinate against brucellosis. Each State decides whether vaccination is needed in their state although APHIS does encourage it in States with affected wildlife populations – including in the Greater Yellowstone Area, where *B. abortus* is still found in wildlife.

RB51 Basics

In February 1996, the Animal Plant Health and Inspection Service (APHIS) licensed *B. abortus* strain RB51 vaccine for use in cattle as part of the cooperative State-Federal Brucellosis Eradication Program. *B. abortus* strain RB51 is a variation of the naturally occurring *B. abortus* wild strain. This genetically stable variation produces antibodies that are different from the antibodies produced by natural infection. This results in vaccinated animals not testing positive on traditional brucellosis diagnostic tests.

Using RB51

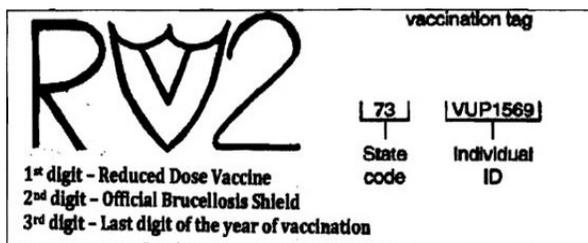
Strain RB51 vaccine must be administered by an accredited veterinarian or by a State or Federal animal health official. Approximately 4,000,000 calves are vaccinated annually as part of ongoing efforts to maintain disease freedom. Given that *B. abortus* is now geographically limited to the Greater Yellowstone Area in wildlife, the need for routine vaccination of calves has decreased.

Strain RB51 is as effective as the previously used *B. abortus* strain 19 vaccine, and causes fewer abortions in cattle. It is currently licensed for use in non-pregnant female cattle 4 to 12 months of age. It should not be given to pregnant cattle as it may induce abortion. If given according to the label, it does not produce any readily observable clinical signs of disease after vaccination, and does not produce a local vaccination reaction at the injection site.

Vaccinated calves (official calfhood vaccinates) must be identified with the standard official USDA vaccination eartag and a vaccination tattoo placed in the right ear. The tattoo is comprised of an "R" to distinguish animals vaccinated with RB51, followed by a shield, and the digit of the last year of vaccination. All vaccinations must be recorded on form VS4-26 available at:

https://www.aphis.usda.gov/library/forms/pdf/VS_4_26.pdf

Sample Brucellosis Tattoo of an animal vaccinated in 2012



Booster vaccinations, known as “adult vaccinations,” may be used as a disease management strategy in areas where *B. abortus* is endemic in wildlife or in case of an outbreak.

Special Considerations

Normally, the vaccine strain is cleared from the blood stream within three days of vaccination and is not present in nasal secretions, saliva, or urine. As a modified live vaccine, in rare cases, vaccinated animals may not clear the vaccine promptly and shed the vaccine strain in milk or other secretions. Because strain RB51 can be shed in the milk of vaccinated animals, all milk or milk products consumed from vaccinated animals should be pasteurized for food safety purposes.

RB51 vaccine is not considered protective against *Brucella suis* (Olsen 2010) and therefore is not useful in areas where cattle may be exposed to *B. suis*.

Brucellosis can affect many other domestic and wild animal species, as well as humans. If people are exposed to strain RB51, the disease can be treated by antibiotics. However, strain RB51 is resistant to rifampin and penicillin.

Strain 19 Vaccine

B. abortus strain 19 vaccine has not been removed from the market or from the Brucellosis Eradication Program at this time. Some States no longer allow vaccination with strain 19, and APHIS has been advised that strain 19 vaccine is no longer being produced.

Bison

While preliminary studies indicate that RB51 is safe and efficacious in bison calves, the vaccine is not yet licensed for use in bison. In order for RB51 to be conditionally licensed in bison, additional safety and efficacy trials must be completed. The vaccine is being used routinely in the Greater Yellowstone Area in farmed/owned bison. Vaccinated bison will be recognized as official vaccinates provided that the proper vaccination charts and identification are completed as required under the [Brucellosis Eradication Uniform Methods and Rules](#).

More Information

For further information, contact:

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Factsheet: [Bovine Brucellosis and RB51](#)

References

Olsen SC, Hennager SG. Immune Responses and Protection against Experimental *Brucella suis* Biovar 1 Challenge in Nonvaccinated or *B. abortus* Strain RB51-Vaccinated Cattle. *Clinical and Vaccine Immunology : CVI*. 2010;17(12):1891-1895. doi:10.1128/CVI.00326-10.