

Wyoming Livestock Roundup article

<http://www.wylr.net/component/content/article/299-animal-health/brucellosis/3567-consortium-continues-brucella-research-in-new-directions>

## **Consortium continues brucella research in new directions**

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Written by Saige Albert

Laramie – The impact of Brucella on livestock in the Greater Yellowstone area and human health around the world is significant, and members of the Consortium for the Advancement of Brucellosis Science (CABS) continue working to address the issues caused by the disease.

“This group works to bring scientists together from around the country to bring a concerted effort to find funding and begin researching a better vaccine, better tests and a vaccine delivery system for brucellosis in elk, cattle and bison,” explained UW College of Agriculture and Natural Resources Dean Frank Galey at the group’s June 14-15 meeting in Laramie. “We felt it was very important to bring this group together to provide an update on what is going on and to brainstorm how we can keep the momentum going.”

Brucella abortus is the bacterial strain causing brucellosis in the Greater Yellowstone Area, and the current vaccine, RB51, has proven to be only partially effective.

“If we could have a better vaccine – a silver bullet – that would be ideal, but I don’t think it will happen in my lifetime,” commented Director of the Center for Public and Corporate Veterinary Medicine at the Virginia-Maryland Regional College of Veterinary Medicine (VMRCVM) Valerie Ragan. “We need to work with and improve what we have.”

Promising research

Professor of Bacteriology Nammalwar Sriranganathan’s research at VMRCVM is aimed at improving the current RB51 vaccine by increasing the immunity of animals to the bacterium.

“Can we enhance the level of protection or broaden the immune response to protect animals?” asked Sriranganathan. “I think we need to look at Brucella as a whole.”

Sriranganathan also noted that in order to provide continued protection antigen must be produced in vivo, or in the live animal.

In his experiments, Sriranganathan genetically enhanced RB51 to influence increased immunogenic ability of the vaccine. His experiments in mice proved to be promising and showed increased protection in challenge studies.

“In vivo expressed antigens are important – they are essential to providing the necessary level of protection,” he explained, adding that the enhanced RB51 showed a significant level of protection in mice. “Ninety-nine percent of the organism (Brucella) is cleared from a challenge in two weeks.”

Sriranganathan’s re-search may provide a promising new development in increasing the effectiveness of the RB51 vaccine in clearing a Brucella infection.

“This strain of RB51 protects mice at significant levels against B. abortus,” concluded Sriranganathan.

New directions

Into the future, CABS decided that pursuing a vaccine targeted at livestock, rather than wildlife, would be a more advantageous direction of focus.

“Worldwide, this is a livestock issue,” commented Assistant Director of the Louisiana Agriculture Experiment Station Phil Elzer. “If we stop the livestock disease, the human aspect goes away. Wildlife

is secondary worldwide.”

With potential developments in improving RB51, Elzer also looked at the potential for Strain 19, saying, “We all know that Strain 19 works.”

The problem with using a Strain 19 vaccine is the inability to differentiate between Strain 19 and a field strain of *Brucella*, which would result in cattle testing positive for brucellosis after being vaccinated, and while RB51 works, Cook said that there are doubts about its ability to offer cattle long-term protection.

“One approach is to change the diagnostic paradigm,” noted Veterinary Epidemiologist for USDA APHIS Pauline Nol, adding that if Strain 19 could be differentiated from a field strain of *B. abortus*, the vaccine provides protective immunity for six to eight years.

#### Research complications

While scientists across the country are working hard to attempt to develop a new brucellosis vaccine, the classification of *B. abortus* as a select agent means that it can only be used for challenge studies at the USDA Agriculture Research Service laboratory in Ames, Iowa.

“We are to challenge with Strain 19,” commented Elzer. “The select agent rules are very detrimental, especially for those of us who want to do a virulent challenge – it inhibits large animal research.”

Using Strain 19 in attempting to challenge vaccines makes research difficult because the strain isn’t identical to *B. abortus* and may respond differently to vaccine.

With the select agent list up for review in 2013, the CABS committee noted hope of getting *B. abortus* removed from the list, which would enable increased research with the pathogen.

#### Farm Bill provision

The group also identified funding as a primary issue, but Galey’s work with Congress provided for the inclusion language in the Farm Bill regarding funding for zoonotic diseases with a reservoir in wildlife, focusing on *B. abortus* and tuberculosis.

“I made contact with Sen. Debbie Stabenow to get funding for this class of diseases,” explained Galey. “The language did make the Chairwoman’s mark of the next version of the Farm Bill, and the U.S. House is still working on their own version. We are hoping to get language in there as well.”

He added that current amendments to the Senate version of the bill do not affect the language, but support is necessary to obtain funding.

“We’re going to have to have outreach and get our stakeholders involved,” commented Galey.

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### **Brucella affects human health worldwide**

Laramie – While brucellosis is a relatively minor problem in the United States, primarily affecting livestock and wildlife populations in the Greater Yellowstone Area, Director of the Center for Public and Corporate Veterinary Medicine at the Virginia-Maryland College of Veterinary Medicine Valerie Ragan noted that *Brucella* affects human health around the world.

“In much of the world, brucellosis is still a major disease because of the effect it has on humans,” explained Ragan at the June 14 meeting of the Consortium for the Advancement of Brucellosis Science. “It causes a disease called undulant fever or Malta fever.”

Ragan described symptoms of undulant fever as being similar to a flu that never goes away.

“People not only feel bad, but they become unable to be productive so it affects the economies of a lot of countries,” added Ragan. “People are not productive, and animals are not productive.”

Brucellosis occurs in much of the world, and she noted that very few countries are brucellosis-free.

“The problem is getting rid of it,” Ragan said. “Most countries have it at some level.”