

# New Test To Keep Horses Healthy

Horses and owners should benefit from two new ARS tests for the disease piroplasmosis. The tests accurately detect the two different parasites—known as *Babesia equi* and *Babesia caballi*—that cause the disease. The tests also eliminate the need to use live horses to produce analytical ingredients.

Piroplasmosis, also known as equine babesiosis, is not found in the United States. But ticks capable of transmitting the disease are found at some U.S. borders.

While the disease doesn't usually cause severe symptoms in animals that are routinely exposed to the parasite, American horses can become very ill or die. Those infected with *B. caballi* can be treated and the parasite eliminated. No treatment has been found for *B. equi* infections.

Horses that enter the country for sale or competition must be declared free of piroplasmosis. American horses that travel to foreign countries must be retested before they can return home.

"The current test, called the complement fixation test, or CFT, has two drawbacks," says Agricultural Research Service veterinary medical officer Donald P. Knowles. First, he says,

the test can give false negative or positive readings, requiring additional tests for verification. That means that horses entering the country must stay in quarantine longer—draining animals that arrive in peak competitive condition and costing owners more in boarding costs. Further, if one horse tests positive, other horses that came on the same plane may also need to be retested.

Second, continues Knowles, the CFT uses infected horses to produce antigens. Antigens are proteins in the parasites that cause horses to produce antibodies in their blood. Although the new tests use the same antigens as the basis for detecting the parasites, Knowles' research team developed a method for producing them that doesn't require horses. In fact, USDA's Animal and Plant Health Inspection Service (APHIS) originally requested that ARS develop these tests to reduce or eliminate use of live animals. Knowles works at the ARS Animal Disease Research Unit in Pullman, Washington.

Knowles and his colleagues with ARS and Washington State University—with support from the horse industry—isolated the genetic material of each parasite and replicated it in bacteria instead of in live horses. Then they developed new, more accurate tests using monoclonal antibody technology. A monoclonal antibody is a laboratory-developed antibody that reacts to only one part of a specific protein—in this case, a protein in a *Babesia* parasite.

ARS and WSU have applied for patents on the piroplasmosis tests. Now the tests are undergoing validation by APHIS' National Veterinary Services Laboratory in Ames, Iowa. The NVSL is the U.S. laboratory that determines the piroplasmosis disease status of animals for import or export. They perform about 32,000 piroplasmosis tests each year.

VMRD, a Pullman company that produces diagnostic test kits, has licensed the first test, for *Babesia equi*, and plans to license the second. When APHIS gives final approval, VMRD can sell the tests. "We hope the test will be available commercially in 2 to 5 years," says Knowles.—By **Kathryn Barry Stelljes**, ARS.

*This research is part of Animal Health, an ARS National Program (#103) described on the World Wide Web at <http://www.nps.ars.usda.gov/programs/appvs.htm>.*

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Researchers have developed monoclonal antibodies that detect both *Babesia equi* and *Babesia caballi*. The pathogens cause the disease piroplasmosis, or equine babesiosis, which does not exist in the United States.