

Piroplasmosis Update



Down on the Farm

by **HEATHER SMITH THOMAS**

Almost every horse imported into the United States must go through a number of tests to make sure it is free of certain diseases. Incoming horses are blood tested for Equine Infectious Anemia (EIA), dourine, glanders and piroplasmosis.

Piroplasmosis in horses is transmitted primarily by ticks, and caused by a protozoan that lives in the red blood cells. This disease is endemic in many countries such as the Caribbean area, South and Central America, Africa, Europe and Asia. At the present time it is not endemic in Canada, Australia, England, Ireland, Japan or the U.S., so efforts have been made to try to keep it out of these countries.

For many years, horses imported into the U.S. have gone through quarantine and testing to try to determine their health status (and whether or not they might be unapparent carriers of piroplasmosis), before allowing them to enter our country. The traditional testing methods, however, were not always accurate. Thus, there may be a number of horses who have come into this country who both have this disease and the potential to spread it to other animals. Efforts are now underway to try to determine how much of a problem this might be.

Kent Fowler, DVM (Animal Health Branch Chief for the California Department of Food and Agriculture in Sacramento, California) is on the Infectious Diseases of Horse Committee (IDOHC) for the U.S. Animal Health Association. Under that IDOHC committee are several subcommittees, and Fowler is chairman of the Equine Piroplasmosis (EP) subcommittee. He is an equine veterinarian who was in private practice for 26 years on the Monterey Peninsula of California before coming to work for CDFA four years ago.

He says that prior to Feb. 1, 2004, horses coming into the U.S. from other countries entered with the "official" Compliment Fixation (CF) test. "Unfortunately, that test occasionally yielded some false negatives especially in horses who had been recently treated with corticosteroids and/or some of the treatments for piroplasmosis that affected the results of the test," he explains.

Thus, some of these imported horses were actually seropositive. "For many years we were taking in these seropositive horses. This is one of the reasons that the C-ELISA (Competitive Enzyme Linked ImmunoAssay) test was made the official import test in August 2005." USDA APHIS began testing imported horses with the C-ELISA test on Nov. 1, 2004.

"There were some bumps in the road regarding getting it finally designated as the official test and there were some adjustments needed. There were some false positives with that test, but those problems were ironed out. After that,

the C-ELISA test became the official test for horses entering the U.S." This test has a high sensitivity and specificity for determining which horses are seropositive.

The piroplasmosis sub-committee (U.S. Animal Health Association) has been concerned about how many seropositive horses are still in the U.S. and would like to make sure that this disease does not become endemic here. There is currently no effective way to trace and follow up on all the horses who were imported earlier. "They move around, and some have left the country. It is also important to remember that these horses entered the country legally, under the "official" CF test," says Fowler.

"So what we are proposing, and in the process of organizing, is a national survey, in which banked residual Equine Infectious Anemia serum from National Animal Health Laboratory Network (NAHLN) laboratories throughout the nation be sent to the National Veterinary Services Laboratory (NVSL) for c-ELISA testing for equine piroplasmosis. The NAHLN has a lot of banked serum from running the EIA (Coggin's) tests. Just as an example, here in California, we run more than 30,000 of these tests each year," explains Fowler.

The USDA Center for Epidemiology and Animal Health (CEAH) is helping establish the ground rules for the proposed survey. "We are hoping to get this residual serum from all parts of the country. The serum will not be identified in any manner (not by horse name, gender or region of the country). It's a random, blind study just to see what the prevalence or equine piroplasmosis is in the U.S. It's just a survey; we are not going to follow up with any individual horses who might be positive," he says.

"There are more than 30 states involved, and 39 labs. We are requesting and, at this point, getting a very good response from the labs that they send unmarked serum to the National Veterinary Services Laboratory at Ames, Iowa. Funding will hopefully be provided by USDA and by their research branch, to help run the C-ELISA test for both organisms causing piroplasmosis (*Babesia equi* and *B. caballi*) on each serum sample. Any positive test will be confirmed at the research center, as well," says Fowler.

"This is where we are right now, regarding the survey. Assuming everything moves ahead as planned, probably it won't be completed for six months to a year—by the time the tests are all run and the results recorded," he says.

Most of the horses imported into the U.S. come from Canada, Mexico and about eight other countries, with a total of about 30,000 horses per year. "This is a fairly large group we're dealing with, and I think most experts feel more comfortable

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with the C-ELISA test as the official import test. These are issues that our subcommittee is working on. The survey results could have a dramatic impact, and resolve the uncertainty of potential prevalence of piroplasmosis in our domestic U.S. horse population. If survey results indicate significant prevalence of infection in our horses, then reasonable efforts to address the disease can be made. We need to know how to proceed, regarding the various regulatory agencies involved. A survey result finding no indication of infection would be very beneficial and welcomed information," explains Fowler.

Although very few clinical cases of piroplasmosis are being seen in the U.S., the experts are saying that this may be because the disease has not yet reached the threshold of infectivity, regarding seropositive horses. "This is what we obviously want to avoid, so it won't become an endemic disease in this country," he says. The tick population in many parts of our country are capable of transmitting piroplasmosis.

Successful treatment at this point has not been validated. "There are some treatment options out there that might be recommended to an owner with a seropositive horse or a clinically ill horse, but at this time research has not found a treatment that is validated to cure your horse. Most of the options available appear to regress the disease for a period of time, but then it returns," he says. The protozoa are not totally eliminated from the blood.

So we can't assume the attitude that if we get some cases we can just treat them. The best defense is to prevent it by not bringing in any more horses who harbor the protozoa. This leaves the question of what do we do about the carrier horses who are already here.

"That's a huge topic of discussion that I think will be spearheaded by the regulatory agencies involved, once we know what the prevalence is. Currently USDA's philosophy is that a positive piroplasmosis horse in an import center (found positive upon arrival and testing) should be exported back to the country it came from, or euthanized. If it turns out that we have a lot of seropositive horses who have been here for a number of years, I suspect that approach will have to be re-examined, to see what other options can be made available. Many of the imported horses are valuable animals, and loved as part of a family," he says.

With piroplasmosis there can be a certain number of horses who are unapparent carriers; they've never been ill but can still provide a source of protozoa that could then be transmitted to other horses via ticks. Today, with the C-ELISA test, these horses are discovered at the import centers, and turned back. But those horses who legally entered the country with a false negative test when the official test was different may still be in this country. Most of the owners who discover they have a seropositive horse will want to do anything they can, to keep the horse. They won't want to send the horse back or euthanize it.

This factor will not only lead to a new look at regulations regarding what to do with seropositive horses, but should also spearhead more research on treatment and vaccination. Those are currently not viable options. But the dilemma of dealing with this disease may help fund more research efforts.

“In many instances the owner of a seropositive horse (imported earlier and never showing clinical signs) would have no idea that the horse was positive. We just need to get a general idea of what the prevalence is, in this country,

and hopefully the survey will help us do that. We are hoping to test about 15,000 samples from across the U.S. The epidemiologists tell us this will give us a reasonable number to base a prevalence estimate upon, with 95 percent confidence,” he says.

“There are several different roads you can take when you start talking about a disease like piroplasmosis. Before you get too far down any one of those roads, it’s best to have some idea what the prevalence is, so this is the first step,” says Fowler. 🐾

The Disease

Piroplasmosis in horses can be caused by two species of protozoa (*Babesia equi* and *B. caballi*), transmitted from an infected horse to a susceptible horse via blood-sucking ticks. The protozoa that cause the disease in horses are part of the same genus of protozoa that cause cattle tick fever (Texas Fever or babesiosis) which the U.S. worked hard to eradicate during the early 1900s, and must keep vigilant efforts to prevent re-entrance via cattle and wildlife from Mexico.

The protozoa are present in the bloodstream of animals in the active stages of infection, but may also persist in and spend part of their life cycle in the tick vector. *B. caballi*, for instance, may persist through several generations of ticks. Contaminated needles and surgical instruments may also transmit the infection physically from an infected horse to a susceptible horse, especially with *B. equi*.

Incubation period in horses is 10 to 30 days for *B. caballi* and 12 to 19 days for *B. equi*. In acute cases the horse suddenly becomes very ill, with fever, anemia, labored breathing, sweating, lack of appetite, reluctance to move, blood in the urine, conjunctival hemorrhages, posterior weakness and swollen abdomen. Some horses may be unable to get up, and die within 24 to 48 hours after becoming ill. Colic may occur in some individuals, and fecal balls may be covered with thick mucus. Gums may be pale, or slightly jaundiced. The horse may be sick for eight to 10 days and then gradually recover. Chronic cases may survive for months. Some individuals never appear to be sick, but are carriers. When adult horses become infected they may act as carriers for variable periods or time or even for life. 🐾