



Susan Tornquist, DVM, MS, PhD, Dip. ACVP

by Rebecca Meluch

Three words you never want to hear again from your veterinarian: “We - don't - know.” But alpaca owners hear the words all too often, because a maddening amount of information remains unknown about these animals.

Several projects, funded through the Alpaca Research Foundation (ARF), are underway to find answers to some of the many questions still out there. I had the opportunity to talk with Dr. Susan Tornquist of Oregon State University about one of these projects, a study with the intimidating title: “Treatment of Alpaca Eperythrozoonosis – Cure or Carrier?” This study is only the latest of several published research projects Dr. Tornquist has done on camelids, so my questions started there.

RM: How did you get interested in alpacas and llamas?

Sue Tornquist: “I went to veterinary school at Colorado State University. There were some llamas at CSU then. I remember thinking at the time that once I got into practice and had some extra time, maybe I'd buy some and try breeding them.”

But after getting her degree, Sue Tornquist went to a small animal practice in Albuquerque for six years, then decided to go back to school to do a residency in clinical pathology. She never did get any llamas.

She received her Ph.D. at Washington State University, and now works at Oregon State University as a clinical pathologist and assistant professor. She lives near the university in Corvallis with her husband, Dirk Lanning, who works at the (human) hospital, and their daughters Miranda, 15, and Molly, 8.



Oregon is a big alpaca state, which has led to a camelid research program at the university. The OSU veterinary college maintains a small herd of 18 alpacas, with which Dr. Tornquist works.

“I should explain what a clinical pathologist is,” says Dr. Tornquist. “I'm not actually a large animal practitioner. Clinical pathology is a branch of pathology that deals with analyzing samples from animals while they're still alive. So we do the blood analysis, the urine, the body fluids, stick needles into lumps and bumps, and try to figure out what's going on there. It's a sort of specialty that allows you to work on all species of animals. I work with every

species, including sharks and manta rays at the Oregon Coast Aquarium.”

RM: What makes one go from veterinary practice into pathology? I mean it's not warm and fuzzy – I'm so glad you're doing it – but...

ST: “It's not warm and fuzzy,” Dr. Tornquist agrees. “Veterinary practice is really wonderful and there are many good things about it, but sometimes it gets a little frustrating because you don't always get the chance to find out what's going on. Pathology is the branch of medicine that allows you to look a little farther and get some more answers. We [pathologists] study the disease itself, and I like that challenge.”

RM: So what's an epe – epe-erythr – What's an epe?

ST: “It's a mouthful, isn't it? An eperythrozoon is a little bacterium that affects the red blood cells. It actually sits on the red blood cells and the immune system sees that as a problem and figures it has to take out the red blood cells

and destroy them. It can lead to severe anemia or mild or moderate anemia, particularly in animals that are stressed or immune-compromised. I don't want to give the impression that this disease is killing alpacas right and left. The organism probably does not kill animals -- at least by itself. We see it more often as a complicating factor in other diseases, and in that sense, it's worth figuring out more about it and how to prevent it."

Dr. Tornquist says that since it was first described in camelids in 1990, we still don't know much more about camelid eperythrozoonosis. For example, we don't know how it's transmitted. Tetracycline is the treatment of choice, but what is unclear is if the tetracycline actually makes the organism go away, or if it doesn't just suppress the disease to undetectable levels. Then, if an animal carrying low levels of the organism gets stressed by shipping or by some other disease, the eperythrozoonosis can start multiplying again.

And it is difficult to study a disease if you can't detect it.

"The standard way you would diagnose eperythrozoonosis is to take blood, make a blood smear, and look for it. But actually, it's a little tiny organism and it does fall off the red blood cells if the blood sits for awhile before making the slide, and it can look like precipitate in the background. So definitely, if you have low numbers of it, it can be hard to diagnose with the standard test."

So Dr. Tornquist and her colleagues came up with a better test -- a PCR-based assay.

RM: What's a "PCR"?

ST: "PCR stands for polymerase chain reaction. It's a way of amplifying the DNA from a sample. So if you have something that's present in a really low level in a sample, you amplify it greatly, then you can detect it that way."

She explains that you have to develop a specific test for each thing you want to examine. Dr. Tornquist's team developed a PCR-based test specifically for camelid eperythrozoonosis.

"Then we actually infected eight alpacas, and we've been using the test to monitor how soon after infection do they get the disease. We gave tetracycline to half of them and not to the other half. A healthy animal usually fights the eperythrozoonosis off on its own in a couple days."

"Now we're monitoring them. We're going to be doing this for about six months. At the end of that time, we're going to see if there's a difference in the two groups as to whether one group still has the organism and the other doesn't, or whether it's wiped out in both, or just exactly how effective is the treatment in absolutely getting rid of the organism. The first step was coming up with this more sensitive diagnostic test. So that's what we're doing with the current project then, and hopefully, we'll figure out how it's transmitted."

RM: Is it transmitted from mother to cria?

ST: "We haven't shown that for sure, but we've diagnosed it in crias as young as a couple of days, so to me, that's pretty good evidence that they can be infected in utero."

RM: Was the mother symptomatic?

ST: "No. With this new and better diagnostic test, we may pick some more of these that are positive. The other question that comes up a lot is: if a veterinarian does a health test on an alpaca and finds that it has low level eperythrozoonosis but otherwise seems healthy, should you test or should you treat all the other animals in the herd? Usually you don't find eperythrozoonosis in the other animals but it may be there in a low level. And that's where our PCR assay could be helpful in detecting. And then: is it okay to sell an animal that has eperythrozoonosis and say that it's a healthy animal?"

RM: The alpacas that you infected for the test, did they fight it off?

ST: "We have one -- it's been two months now -- we continue to pick it up in him."

RM: Was he treated or untreated?

ST: "The one having the recurrences was treated with antibiotics."

RM: Is there any geographical preference for this bug?

ST: "It's been described pretty much everywhere."

RM: Is it seasonal?

ST: "The seasonality question is interesting. Here in Oregon -- this is not based on study, just on observation -- we tend to see it more in the late summer and fall, not so much in winter. So that sort of fits with the notion that maybe there's an insect vector, but that hasn't been proven."

RM: Can it spread through mating?

ST: "Possibly. We can't rule that out. But due to the nature of the organism -- that it's found in blood and nowhere else -- it makes it a little less likely that that's actually the case."

RM: Once the alpaca has recovered on its own once, is it immune?

ST: "We don't know that, either. But they do make antibodies, which is part of the immune response. We don't know for sure if that antibody is protective. And that's another thing that would be good to look at. I don't know if this disease is enough of a problem that we would ever want to develop a vaccine, but that's the kind of question that's important when you're considering the merits of developing a vaccine."

RM: If we treat the alpacas for it and they still have it, are we making supergerms?

ST: "In most of them that are treated, it's never a problem again. Clearly, the treatment doesn't work 100% of the time in all cases."

RM: What's an owner to do?

ST: “At this point as an owner, I would say don't worry about it too much. If you have animals that aren't doing right, they are losing weight and seeming sick, you would naturally probably have a vet check them out.”

“We haven't started doing the new PCR-based test as a regular diagnostic test – which means we don't charge money for it. Obviously, eventually, we'll have to do that because it's not cheap to run, but we're still at that point where we're interested in test-

ing strains from different parts of the country, and so it's actually helpful to get samples from animals in different places. So at this point, if someone wanted the PCR assay run, they could contact me and we could set up sending in some blood and testing it.”

“Having been at both ends – in practice and wishing I had all the answers, then being in research and realizing how long it can take to get anything done – I know it's frustrating for the veterinarians and for the owners. It just takes time, but eventually, if you keep working at it, you get it. Eventually.”

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