

Dr Susan Tornquist, Oregon State University

## ■ Blood Substitute Treatment for Anemic Alpacas

**A** current project at Oregon State University may provide alpaca breeders with a reason to sigh in relief. This study will determine whether or not polymerized ultrapurified bovine hemoglobin (PUBH) blood substitute is an effective treatment for anemia in alpacas. Dr. Susan Tornquist of OSU in Corvallis is the principal investigator in the study, “Effects of polymerized ultrapurified bovine hemoglobin blood substitute in anemic alpacas.”

Anemia, which literally means “without blood,” is an abnormal decrease in the number of red blood cells. It results in a reduced ability of the blood to transfer oxygen to body tissues and organs. Hemoglobin, the oxygen-carrying protein in red blood cells, must be present to fully oxygenate tissues and organs. Anemia is a common problem in alpacas, according to Dr. Tornquist.

Veterinarians and referral centers are often presented with anemia as a primary problem or along with other diseases and conditions. A number of factors can cause anemia: blood loss, blood parasites, bone marrow disorder, an immune system reaction against red blood cells, a lack of the stimulating hormone erythropoietin, or chronic inflammation. If they have anemia, alpacas may act listless, depressed, or tired. Their gums may also look less pink than usual.

### **Anemia Treatments**

“Although anemia may be treated directly or resolve when underlying diseases are treated, the

lack of oxygen-carrying capacity induced by anemia can delay or prevent successful medical treatment,” Tornquist said.

Standard treatments include primarily treating the underlying cause. For example, a veterinarian may stop the bleeding, use medications to get rid of parasites, or treat the infection that’s causing the secondary anemia. She said blood transfusions may be used, but there are several potential problems associated with transfusions. “Red blood cells from one alpaca may cause a reaction in the recipient animal,” she said. “There can be problems with the collection and storage of blood. If it becomes contaminated, it can do more harm than good.” She added that whole blood has a very short shelf life and must be stored appropriately.

Many veterinarians don’t have the time or resources to safely transfuse alpacas. Also, blood products for alpacas are not readily available commercially, and potential donors may be difficult to find when needed. According to Tornquist, a blood substitute product has been approved for use in dogs for about five years and has been safely and effectively used in other animal species, as well. Studies using a blood substitute in alpacas have not been published, which is what prompted Tornquist to propose this study.

### **PUBH Blood Substitute**

PUBH is chemically-stabilized in a balanced salt solution. It is stable, sterile, and does not have to be



The Alpaca Research Foundation (ARF), in conjunction with Morris Animal Foundation (MAF) and other groups in the llama and alpaca communities, provides funding grants to veterinarians and scientists engaged in research that has the potential to improve the health and well-being of our animals. Alpacas Magazine is pleased to bring you another in a series of interviews with the researchers carrying on this important work.

## Blood products for alpacas are not readily available commercially, and potential donors may be difficult to find when needed.

kept refrigerated. “It also doesn’t contain any cells, so animals don’t develop immune reactions to it the way they might develop immune reactions to transfused red blood cells,” Tornquist said.

PUBH is ultra-purified by a patented method to remove contaminants, bacteria, viruses, and other possible pathogens. More than likely, if the underlying cause of anemia is treated by using methods such as the PUBH blood substitute, it won’t reoccur.

Tornquist said the study is going well for her, the three veterinary students, and one research associate who are working on the project. So far, they haven’t seen any adverse effects. She admits that it did take them a while to work out the techniques of the study, like using jugular catheters in both sides of the neck when administering PUBH and the control substance. “We’ve been surprised how long it takes our alpacas to recover from the anemia after we make them anemic,” she said.

### **Dr. Tornquist**

As associate professor and clinical pathologist, Tornquist deals with diseases in all kinds of animals, both domestic and wild, but her primary area of research is *Mycoplasma haemolamae*, a red blood cell parasite of alpacas and llamas. In the past, she was involved in developing a sensitive diagnostic test for *M. haemolamae* and also studied the efficacy of several antibiotics. “I try to do an accurate and

timely job of diagnosing, and I am trying to educate future veterinarians so they will be competent,” Tornquist said.

A typical day for her includes running a diagnostic lab, looking at slides and samples, and reporting results as well as teaching. She is also associate dean for student and academic affairs, so along with animal problems she deals with student problems in the curriculum and scheduling as well.

With interests in biology, animals and medicine, veterinary medicine was the natural choice for a profession. “After being a veterinarian in a small animal practice for about six years, I was ready for a change and decided to do a residency in clinical pathology,” she said. Tornquist received her Ph.D. at Washington State University and has been at OSU since 1996.

“When I came to Oregon State University, I recognized that we had a unique opportunity to study alpacas here because there are so many in the area and so many good people working in the area of camelid research at OSU,” Tornquist said. “There are also many supportive owners and organizations.”

---

Shana Knoblock is a second-generation alpaca breeder. She and her family own and operate Knoblock’s Prairie Ranch in Sabetha, Kansas. Shana can be reached at [info@knoblocksalpacas.com](mailto:info@knoblocksalpacas.com) or (785) 284-2589.