

■ Prevalence of Mycoplasma Haemolamae Infection in South American Camelids in the Southeastern United States

Alessandra Pellegrini, DVM, PhD, DACVIM is conducting research at the University of Georgia College of Veterinary Medicine, regarding the prevalence in camelids of Mycoplasma haemolamae in the southeastern United States. Susan Sanchez, MSc, PhD, MIBiol, CBiol, will also participate in the study. The project mentor is Lisa H. Williamson, DVM, MS, DACVIM. Funding for this project is being provided by Morris Animal Foundation and the Alpaca Research Foundation.

Mycoplasma haemolamae (MH), formerly known as Eperythrozoon or EPE¹, is a red blood cell parasitic bacterium. Unfortunately, little is currently known about this particular bacteria and work is just now being undertaken to understand the exact details of how it affects alpacas and llamas, as well as its prevalence in other North American camelids. Veterinary science does know that this genus of bacteria (Mycoplasma) affects other species. It is also known that each species of mycoplasma is limited in the particular species of animal that it can infect. For example, Mycoplasma haemolamae can infect alpacas and llamas, but cannot infect a cat. The reverse is also true: a cat mycoplasma cannot infect a llama or alpaca.

What is also known is that the bacteria attach themselves to red blood cells, where they feed on

proteins. Like other bacteria, the mycoplasmas can remain at a low level in the blood and the animal's immune system appears to be able to keep it under control; no signs of illness are readily seen. However, MH is also capable of multiplying and replicating to a high level. When this occurs, the result is anemia. If the anemia is untreated, it can be fatal as the MH becomes so very numerous that the red blood cells are destroyed and their ability to carry oxygen decreased to a critically low level. It is believed that the disease progresses when the animal's immune system becomes compromised and fails to control the bacteria's growth. As with many diseases, stress – both physical and psychological – seems to affect immunity levels so that changes in weather, feed, travel, and even social status can trigger a decreased immunity.

Thus, other physical ailments are sometimes seen in combination with anemia. It is often the secondary medical problem that attracts the attention of the alpaca breeder. However, we are not yet completely sure whether it is the secondary illness or the anemia caused by the MH that comes first. The two conditions do appear to be related and working together to create a medical problem for the animal.

When the level of MH becomes so numerous that they can be visualized on a blood smear under a microscope, the animal is usually critically ill.

1. The name change from Eperythrozoon to Mycoplasma haemolamae occurred when the bacteria was more accurately classified in 2002.



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.



Dr. Pellegrini working with some of her alpaca "patients."

Again, anemia is the primary effect of the bacteria and is easily detected by performing a relatively simple packed cell volume (PCV), which tells the percentage of red blood cells in the blood. More research into these areas appears to be needed to more fully understand the overall effects of MH.

Historical information also seems pertinent to explain in regards to MH. Prior to 2002, the only way to identify MH was through the use of blood smears. Again, the number of bacteria seems to be closely linked to observable illness in an animal. Hence, the disease was only identified as MH in very seriously ill animals that were already experiencing the effects of anemia and, in some cases, other disease processes. Consequently, MH was thought to be a very serious infection that more likely than not resulted in an animal's demise. In short, the veterinary community did not have the tools necessary to accurately identify the bacteria BEFORE it became numerous enough to be seen

on a blood smear.

In 2002, Dr. Susan Tornquist of Oregon State University College of Veterinary Medicine developed a PCR test that was able to identify the presence of the bacteria, even in very small amounts, and prior to being numerous enough to be seen on a blood smear. Since that time, it has been discovered that "a much larger number of animals are infected with MH, but show no symptoms of anemia, disease, or ill-thrift." According to Dr. Pellegrini, "As a result of better testing, things have changed and we are now seeing infected animals that appear to be healthy and thriving. We need research to provide a scientific basis upon which to build further knowledge of this bacterium and its effects on alpacas and llamas."

The primary goal of Dr. Pellegrini's study will be to identify the number of animals that are positive for MH in the southeastern part of the United States. Because severe cases of MH infection often result in a poor outcome for the animal, there

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remains an assumption that this bacterium is often deadly. Breeder concerns about farm bio-security, show attendance and admission, and treatment of infected but non-symptomatic animals are a few of the questions that have arisen as the result of MH being detected in a herd. Dr. Pellegrini states that, “We need to better understand just how many animals are infected, as well as how frequently it results in disease, to assess if there is a potential for impacting breeder economics.”

In addition to learning the prevalence of MH in the southeastern United States, Dr. Pellegrini and her team are performing a packed cell volume (PCV) on all sampled animals. The blood counts will then be compared to detect animals who are anemic and those who are not. “We may discover that some animals are only slightly anemic, sub-clinical (i.e., not showing any symptoms). We may also discover that some positive animals have no anemia at all,” according to Dr. Pellegrini.

Having blood counts to compare between infected and non-infected animals will then allow the veterinarians to better determine the role that MH plays in an animal’s health, as well as learn more about the impact of MH over the health of an entire area of the United States. Dr. Pellegrini stressed, “We are in great need to gather hard data on MH in order to more fully understand not only the impact on individual animals, but the overall impact on all animals in North America.”

The discovery of the incidence of any amount of MH in the blood will further the basis on which to determine future needed studies of this organism as it relates to alpacas and llamas.

Also included in this study will be a fecal egg count, to rule out intestinal parasitism as a cause of anemia, and to discover any relationship that might exist between MH infection to intestinal parasitism. There currently exists no hard data in this area, though there is some anecdotal evidence that MH-infected animals may carry a greater intestinal parasite load than non-infected animals.

The question of bio-security is also a very real concern for alpaca breeders. As we become ever more aware of issues surrounding contagious diseases, as well as transmission of parasites between animals, we must look for realistic ways to help prevent the spread of all contagion that impact our alpacas. In terms of helping contain MH, we currently are not aware of either what can be done or even should be attempted. As Dr. Pellegrini explains, “We know that MH is a blood-borne disease and that, in other animals, biting insects act as the vector for transmission between animals. In alpacas, we can assume as much, but do not yet possess the data to verify that insects truly are the vector – nor exactly which biting insects are responsible for spreading the disease.” Dr. Pellegrini further states, “The one thing that breeders can easily do is to make sure that they use a separate needle and syringe for each animal when giving medications and take care to NOT contaminate injectable drugs. Shearing blades may possibly be another route of infection that can be controlled by taking care to clean them carefully and use a disinfectant between animals.”

Treatment issues and recommendations will NOT be addressed in this study, though there are certainly many questions that surround this topic. Dr. Pellegrini strongly urges breeders to work closely with their veterinarians if MH is discovered in one of their animals.

In summary, Dr. Pellegrini and her associates will be gathering hard statistical data to “determine the prevalence of this parasite within the camelid population in the southeastern United States and to evaluate if infection is related to clinical signs.” From the data collected, many additional avenues

will be opened for investigation. As with other infections and illnesses in camelids, our knowledge base of MH is limited. This study will further help veterinarians and breeders alike to more thoroughly understand this blood parasite, as it also opens the door for future research.

Dr. Pellegrini wishes to thank the Alpaca Research Foundation and Morris Animal Foundation for making funds available to conduct this important research study. She also wishes to thank the Southeast Alpaca Association for making their herds available for this research and further states, "It is truly a pleasure working with them and their animals."

In turn, ARF wishes to thank Dr. Pellegrini for her work with alpacas and *Mycoplasma haemolamae*. The entire alpaca community looks forward to the results of her study.

Dr. Pellegrini earned both her DVM and PhD at the University of Pisa in Pisa, Italy. Her PhD work focused on equine exer-

cise physiology. Her internship in large animal internal medicine was at Cornell University, followed by a residency at the University of Pennsylvania. She is now Board Certified in the specialty of Large Animal Internal Medicine.

Dr. Susan Sanchez is the head of the microbiology laboratory at the University of Georgia College of Veterinary Medicine. She recently developed a *Mycoplasma haemolamae* PCR test that is available for camelid owners and veterinarians at the University of Georgia, Athens Diagnostic Laboratory.

Dr. Lisa Williamson earned her undergraduate, Masters, and DVM degrees at the University of Georgia. She became interested in alpacas after working with goats and sheep, where she began seeing deaths attributable to antiparasitic drug resistance. Alpacas then began being seen with the same resistance. Dr. Williamson enjoys working with both the alpacas and their owners.

Susan Forman is the owner of Dewey Morning Alpacas in Washington Court House, Ohio. She currently owns 15 alpacas and two Great Pyrenees who dutifully watch over her small herd. She can be reached at susan@deweymorningalpacas.com or (740)636-1899.