Prevalence of the Parasites Cryptosporidium spp. and Eimeria macusaniensis in Local Alpaca Herds Within the Chippewa Valley

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Introduction

Alpacas (*Lama pacos*) are South American camelids which are growing widely in popularity as companion animals in the United States (Figure 1). They are valuable animals typically raised for their wool and competition in showing events. As with many neonatal mammals, crias (young camels, less than 1 year old) are susceptible to many gastrointestinal pathogens. Recently, the camelid community has become interested in the growing number of reports of parasitic protozoa, including Cryptosporidium spp and Eimeria macusaniensis.

Cryptosporidium is a protozoan parasite that causes gastroenteritis in many vertebrates, including humans. The prevalence of Cryptosporidium in alpacas, however, is not well known. Over a period of years, veterinary teaching hospitals have accumulated a number of cases implicating the role of Cryptosporidium in camelpid diarrhea (Cebra et al., 2003, Waitt et al., 2008). These reports describe only a few clinical cases, whereas Cryptosporidium is well known to be frequently carried and shed by asymptomatic hosts. However, no studies have assessed the prevalence of Cryptosporidium in asymptomatic crrias in the United States.

Eimeria macusaniensis is a protozoan pathogen that was first described in camels in 1971 (Guerrero et al.). It can cause gastroenteritis, but adults may also asymptptomatically shed oocysts (Cebra et al., 2007). It has only recently become of interest due to its recognized prevalence (Jarvinen, 1999). It is not clear whether the increased reporting of *E. macusaniensis* is due to increased pathogenicity of the parasite, a buildup of infective oocysts on pastures, or simply an increase in camelpid ownership and veterinary care. Only one study of *E. macusaniensis* has been conducted in the midwestern United States, in which only a few alpacas from Wisconsin were examined (Jarvinen, 1999).

Cryptosporidium and *E. macusaniensis* are well-established veterinary pathogens, yet this study is the first to examine their prevalence in asymptomatic crrias in western Wisconsin.

Methods

Fecal samples were obtained rectally from two separate herds representing a total of 49 suri crrias and 1 huacaya cria (Figures 2 & 3). After collection, the samples were split and processed by a method appropriate for each parasite.

Samples analyzed for *Cryptosporidium* were smeared onto a microscope slide, heat fixed, and then stained with carbol fuchsin and malachite green. The resultant slides were examined by oil immersion microscopy for the presence of Cryptosporidium oocysts, which appear as small, red spheres (Figure 4).

Samples analyzed for *E. macusaniensis* were emulsified in water and subjected to a floatation technique described by Jarvinen, (1999). The prepared specimens were examined by microscopy for the presence of *E. macusaniensis* oocysts which can be identified by their brown color and prominent microspore (Figure 5).

Results

All of the samples were negative for the presence of *E. macusaniensis*. However, out of the 50 samples analyzed, 2 were determined as positive for Cryptosporidium based on the presence of the red-staining oocysts characteristic of the parasite.

Discussion and Conclusions

*Cryptosporidium* and *E. macusaniensis* are microscopic protozoan parasites that are transmitted via fecal contamination from an infected animal. Once an animal becomes infected, these parasites can cause gastrointestinal illness, dehydration, and occasionally death. The more serious cases, including those that are fatal are often seen in animals that are very young, very old, immunocompromised, or stressed.

*Cryptosporidium* has been found in various clinical cases involving crrias that were exhibiting diarrhea, however it has not been established in asymptomatic crrias (Waitt 2008). Of the 50 crrias that were sampled, none of them were showing any signs of illness at the time of collection. The fact that 2 crrias tested positive for *Cryptosporidium* is substantial as this is the first report of asymptomatic shedding of oocysts by crrias within the United States. However, microscopy isn’t an effective method at identifying the species of the parasite, so genetic typing is needed to determine which species of *Cryptosporidium* is prevalent in alpacas. *E. macusaniensis* is a common parasite that is well known by alpaca owners but has only been recently recognized as a veterinary pathogen. Only one study has been conducted in the midwest which included only 4 herds from Wisconsin (Jarvinen,1999). If positive results were found, this study would have offered a more localized prevalence of the parasites in the area. The negative results attained could be contributed to the cleanliness and management of the facilities. Since *E. macusaniensis* oocysts require 13-21 days to become infective in deposited feaces, the daily removal of waste employed by the owners could decrease the possibility of transmission. In addition many alpaca owners often limit the possibility of infection by conducting routine fecal parasite surveillance and supplying timely antiparasitical treatment (Cebra, 2007). In order to gain a better understanding of the prevalence of *E. macusaniensis* in western Wisconsin, further studies should be done using a greater number of herds.

References: