

TRAIL HORSES DO NOT SPREAD MICRO-ORGANISMS SUCH AS CRYPTOSPORIDIA AND GIARDIA

HORSES DON'T POLLUTE THE WATERSHED

A Position Paper of the Boulder County Horse Association

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Abstract

Horses have long been the quintessential icon of the diverse American traditions of farming, ranching, mining, exploration, settlement, hunting, outdoor recreation, and nature appreciation on public lands. Of the approximately 6.9 million horses in the United States, about a third (2.9 million) are used as recreational trail companions and a means of transportation into front country and backcountry settings (American Horse Council, 2001). About 145,000 horses call Colorado home, and approximately 57,000 of those horses are considered to be recreational trail horses, including pack stock (Colorado Horse Development Authority, 1999; AHC, 2001). In Colorado alone, recreational trail horses provide a \$500 million economic benefit and support 5,200 full-time jobs – the state's largest equine-related category (AHC, 2001).

In recent years regulatory pressures have increased on all forms of recreation, from backyards to municipal parks to National Parks. Although statewide the number of acres in the public domain has increased, and trail mileage has increased somewhat, neither has increased as fast as the population; meanwhile, maintenance budgets have been shrinking. These imbalances have created tensions among trail user groups, environmentalists, and public land managers, as each constituency fights for its share of what it sees as a shrinking pie. Equestrians have come under more than their share of scrutiny, sometimes over a generalized anxiety about whether horses might spread micro-organisms such as *Cryptosporidium* and *Giardia*, or contaminate watersheds with other pollutants.

The Colorado Horse Council, Back Country Horsemen of America, Boulder County Horse Association, and many others have conducted extensive research into the available literature on this subject. We have discussed the issue directly with researchers in the field and with agency personnel. We also contribute considerable personal experience representing thousands of trail miles ridden and hundreds of trail miles built, as well as managing our own horses throughout the country.

It is our professional belief that adult recreational trail horses are not likely to be significant source of micro-organisms such as *Cryptosporidium* and *Giardia* in watersheds, nor do they provide excessive amounts of other contaminants. We support best management practices for trails and reducing runoff in equine areas, and we outline some of these principles in this paper.

Introduction

The research discussed below specifically evaluates horses and their effectiveness, or lack thereof, at spreading micro-organisms. While it is possible for some mostly young, otherwise unhealthy horses to pick up these organisms for short periods of time, their digestive and immune systems process them rapidly to the organisms are unlikely to survive. Furthermore, young and unhealthy horses are not likely to be taken on trails or to trailheads, and are thus extremely unlikely to spread viable organisms into natural ecosystems.

It has also been our experience that in various attempts to ban horses from public lands, horses are frequently accused of contaminating surface water with bacteriologic or nutrient overloads. Again, the literature overwhelmingly refutes this fear, as long as best management practices are followed.

BCHA hopes that this position paper puts many of these fears to rest.

Cryptosporidium parvum and Giardia duodenalis

Water-borne pathogens of greatest concern to humans that potentially might be transmitted by livestock are discussed by Atwill of UC Davis, in a paper entitled "Pathogens excreted by livestock and transmitted to humans through water" (1997). These include the protozoans *Cryptosporidium parvum* and *Giardia duodenalis*; others include *Campylobacter spp*, *non-typhoid Salmonella*, *Yersinia enterocolitidis* and *E. coli*. The ubiquitous bacterium *Aeromonas spp*. has also been suggested as a species of concern to humans, as described in a paper by Derlet and Carlson (2004), but Canadian Material Safety Data Sheets note that there are no known zoonosis or vectors associated with this organism (www.phac-aspc.gc.ca/msds-ftss/msds6e.html).

An excellent meta-analysis of this issue has already been conducted, and may be found in Brophy, Bridgeman, Quinn, and Erb, 2008. The authors concluded that "the risk of horse pathogens contaminating humans (zoonoses) is extremely small."

Four faculty members at the University of California, Davis collaborated on an exhaustive study of the prevalence of shedding of *Cryptosporidium* and *Giardia* in trail horses in 1995. They began their study because concern over these protozoa in drinking water was leading California public land management agencies to limit access to public lands for recreational horseback riding, but that such actions were being made in the absence of scientific data linking the presence of these pathogens in surface water to patterns of equestrian use in a watershed region. " The authors found conclusively while dairy calves have been incriminated as a source of contamination of public drinking water supplies, none of the samples from the recreational trail horses were found to be positive. Their report states definitively

that “backcountry use of horses for recreational riding is unlikely to pose a significant risk of environmental contamination from *Cryptosporidium* oocysts or *Giardia* cysts of equine origin nor is it likely to create a significant threat to human health from either of these protozoans.” (Johnson, E. et al, 1995).

Atwill has found that wild animals have substantial rates of *C. parvum* in their guts, significantly higher than those found in either humans or horses. For example, 30% of mice, 63% of rats, and 11% of feral pigs carried this organism, compared with 0-3% of horses. Furthermore, Atwill quoted Robertson et al (1992) who found that the life expectancy of most of the protozoa discussed, when deposited in manure on a trail, is very short: “Oocysts appear to die after several hours of being dry.”

In a study by Colorado State University in Fort Collins, fecal matter of 300 horses entering 23 different trailheads in Colorado was evaluated. Only one was positive for *C. parvum* and two for *Giardia*; however, the horse was immunocompromised and had probably drunk contaminated water downstream from a known beaver habitat. The authors concluded, “Based on the low prevalence of *Cryptosporidium* in the trail horse population studied, the adult recreational trail horse population is not likely to be a significant source of *Cryptosporidium* environmental contamination in watershed areas.” (Forde et al, 1997).

Organic Contaminants

Numerous and thorough studies and reports have been published exonerating horses on whether they are responsible for contaminating watersheds with nitrogen, salt, phosphorus, potassium, or other materials. The preponderance of the evidence is that horse manure is benign to the environment. Because so much research has been done on this topic, time constraints preclude an exhaustive analysis of this literature by BCHA. The reader is encouraged to check into this literature and to ask us for further information if needed.

Conclusions

As quoted in a summary on this issue by Adda Quinn, founder and principal in EnviroHorse, “Dr. Aaron Wildavsky, Professor at the University of California Berkeley, has written, ‘The richest, longest-lived, best protected, most resourceful civilization is on its way to becoming the most frightened. Government has contributed to this process by taking responsibility for risk management away from individuals.’ People are exposed to a variety of risks every day of their lives and must make decisions about which risks to ignore and which ones to manage actively. We believe that exposure to horse manure is one fear people can cross off of their list of things to worry about.” We concur.

Best Management Practices

“Horses are important for companionship, sport, work, pleasure, education, and therapy. ... In addition to playing an important role in the ... economy, horses help to maintain open, green spaces that add to the scenic beauty of the state. Horses and the farms on which they live are often very valuable. To be good stewards of the land, however, horse farmers should manage their farms in a way to minimize the potential for negatively impacting the environment with horse manure.” (Westendorf, 2004).

Recreational trail horses comprise a tiny fraction of total trail users. For example, in April of 2006, 73,816 recreational users visited Rocky Mountain National Park, 224 of which were “either” snowmobiles or horses. Similarly, 25,911 recreationists visited Redwood National and State Parks in California, of which only 496 were day-use horseback riders (NPS Public Use Statistics Office Website, 2006). Boulder County Parks & Open Space regularly reports that about 2% of its annual visitors are equestrians (BCPOS website, 2008). The number of horses out on the trails nationwide is statistically small compared to other visitors, and carries a similarly small potential for impacts.

In spite of our relatively small demographics, trail use and equestrian access to public lands are extremely important to the horse people who choose that form of recreation.

We recommend that equestrians and public land managers alike adhere to the following set of best management practices to reduce the spread of pathogens and organic pollution on public lands:

- 1) Trails should be kept a reasonable distance from live bodies of water as much as possible depending on the local climate and vegetative cover, with designated crossings that have been hardened to encourage use and prevent erosion.
- 2) Manure should be removed from stalls and corrals on a regular basis.
- 3) Manure may be composted and spread on-farm or in another approved area that is level and not close to a wetland or the water table.
- 4) When spreading manure, it should be harrowed or otherwise incorporated into the soil.
- 5) Composting of horse manure will result in the destruction of internal parasites.

“The bottom line is that horse trails can be maintained on most natural areas without unacceptably impacting ecological values” (Williams and Conway-Durver, 1998).

If these guidelines are followed, land managers will be able to avoid draconian measures with regard to restricting equestrian use, and horse people will be able to continue enjoying the many diverse forms of public land that have been open to them for centuries, for many more years to come.

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