

FAILURE TO DIAGNOSE FLUORIDE POISONING IN HORSES CAUSED BY WATER FLUORIDATION

SUMMARY: Since 1974 a widely accepted dry weight dietary fluoride tolerance of 60 ppm F for horses has been recommended by the US National Academy of Sciences. A recent study, however, revealed that artificially fluoridated drinking water (≤ 1.3 ppm F) was the cause of previously undiagnosed chronic fluoride poisoning in Quarter horses on a farm in Pagosa Springs, Colorado, beginning in the mid-1980s. After fluoridation was terminated there in March 2005, colic, stiffness, lameness, and other reversible manifestations of fluorosis have gradually disappeared.

Keywords: Dietary fluoride tolerances for horses; Failure to diagnose fluorosis; Fluoride poisoning of horses; Pagosa Springs, Colorado; Water fluoridation.

This issue of *Fluoride* presents a very disturbing account of serious harmful effects of artificially fluoridated water in Quarter horses on a farm in Pagosa Springs, Colorado.¹ According to the 1974 dietary fluoride reference standards for livestock issued by the US National Academy of Sciences–National Research Council (NAS-NRC), horses can safely tolerate up to 60 ppm F in the dry matter of their diet.² Yet before water fluoridation was introduced in the mid-1980s, the horses on the Pagosa Springs farm were healthy and thriving, drinking nonfluoridated water and feeding on uncontaminated pasture, hay, and mineral supplements. However, after the drinking water was artificially fluoridated (up to 1.3 ppm F), the condition of the horses began to deteriorate, leading to dental fluorosis, colic, stiffness, lameness, and even poor reproduction.

Even after examining the horses, local and professional school veterinarians failed to reach a diagnosis, and when asked by the owner if fluoride poisoning might be the cause, they simply discounted and dismissed her suggestion. Yet none of the veterinarians had apparently even looked at the teeth of the horses to determine if dental fluorosis was present, which, as seen in the report, was plainly evident.

How could this have happened? If these veterinarians had learned *how* to recognize the symptoms of chronic fluoride intoxication and had *not* been taught that debilitating fluorosis cannot occur from fluoridated drinking water, they would undoubtedly have been able to recognize what was ailing the horses. However, their education, like that of many physicians, dentists, and public health officials, often lacks this important information. Earlier editions of clinical toxicology textbooks and reference manuals usually contained considerable information on how to diagnose and treat chronic fluoride poisoning.³ Unfortunately, later editions of many of these texts published after the 1974 NAS-NRC report on fluoride² and the follow-up 1977 NRC report on *Drinking Water and Health*⁴ have adopted the recommendations of these reports concerning supposedly safe dietary reference standards for fluoride for livestock and for humans.⁵ Although they were later clearly shown to be too high and harmful for dairy cattle,⁶ the official 1974 fluoride recommendations were never changed. Even recent editions of texts on environmental aspects of toxicology^{7,8} and fluorides⁹ still cite the 1974 and 1977 NAS-NRC tolerances for fluoride.

Equally disturbing is the fact that even before the 1974 NAS-NRC fluoride report was prepared, solid evidence was available showing that the effects of fluoride in drinking water on livestock are comparable to those experienced by humans.¹⁰ Later, in 1977, a long-time researcher at the National Research Council of Canada assembled data recommending a maximum of 1.0–1.5 ppm F in the drinking water over a 30-day period for dairy cattle, breeding stock, and other long-lived livestock (presumably including horses).¹¹ For other kinds of livestock, a 30-day average maximum of 2.0–4.0 ppm F was considered acceptable, but if additional F is present in the feed or mineral supplements, then this would be reduced to 1.0–2.0 ppm F in the drinking water.

From the findings reported in this issue of *Fluoride*,¹ it is clear that debilitating chronic fluorosis can occur in horses, even at the supposedly safe level of 1 ppm F in the drinking water. It is also clear that teachers and textbooks need to look beyond official reports and pay closer attention to research findings that contradict those reports.¹²

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