



Down on the Farm

Weaving In Confined Horses

by HEATHER SMITH THOMAS

Weaving is a common “vice” of horses kept in stalls, and sometimes occurs in horses confined to small pens or paddocks. Once a horse starts this compulsive habit, they may continue to do it even when turned out, standing by the fence or gate and shifting their weight from one front foot to the other.

Weaving has occurred in stabled horses for a long time. It was described in N. H. Hayes’ veterinary text of 1877: “This habit consists of a swinging movement of head and neck and the anterior parts of the body, backwards and forwards, so that the weight rests alternately upon each forelimb. Sometimes the feet remain upon the ground, but in bad cases each foot is raised as the weight passes over on to the other, and the swinging of the head and neck becomes very exaggerated. The habit may be intermittent or constant, and in the latter case the horse does not get sufficient rest. A horse thus incessantly on the feet will seldom carry flesh or be safe to ride or drive. The principal effect is useless fatigue of muscles of the anterior part of the body and a tendency to stumble when at fast work. Weaving starts as a habit, develops into a vice, and eventually becomes a nervous disease, constituting a radical unsoundness for which a horse may be returned to the seller.”

This type of action is called stereotypical behavior—a rhythmic or repeated action that is an abnormal expression of an otherwise normal action. Whenever a horse develops this type of abnormal behavior, it is a clue that something is wrong with his environment; his needs are not being met. Once established, a stereotypic behavior can become a need in itself and the horse insists on continuing it, as a way to cope with his situation.

An Addiction?

By definition, a sterotypy is a ritualistic and repetitive type of behavior that serves no apparent purpose. These “stable vices” are seen in about 15 percent of domestic horses.

Dr. H. George Nurnberg, Medical Director, University of New Mexico Mental Health Center, is a psychiatrist who has studied stereotypic and compulsive behavior in humans and animals. “It seems that every species does these sorts of things,” he says, such as paw licking, tail chasing and flank sucking in dogs, fur chewing in Siamese cats, cage pacing in zoo animals, snout rubbing in pigs and feather plucking in caged birds. Humans who are stressed often chew fingernails, twirl a strand of hair, rub the scalp, chew on a pencil or do some other compulsive action. In horses, the repetitive action may be head bobbing, kicking the stall, chewing at themselves, blanket chewing, cribbing, weaving or stall walking.

Confinement is what generally brings on abnormal equine behavior. A horse with a lot of nervous energy will not stand idly for hours at a time, and generally finds some

means to expend energy or vent his frustration. Boredom and inactivity, along with anxiety spawned by being unable to roam freely and interact with other horses, are the triggers for a stall vice.

During the 1980s, researchers at Tufts University School of Veterinary Medicine (led by Dr. Nicholas Dodman) discovered why horses crib, why the habit is so persistent, and found that factors in cribbing are the same for compulsive habits like weaving and stall walking. Whenever an animal or human is stressed and engages in a repetitive activity as an outlet for pent-up energy or to vent frustration, certain chemicals are released in the brain. Thus, when a horse starts a constant repetitive action such as weaving or cribbing in response to environmental factors, he may keep up the action because he finds that repeating it triggers release of the stress-reducing morphine-like proteins (opioids) which suppress pain and create a pleasurable sensation. These endorphins reduce the stress level and the horse tends to relax—and seems “spaced out” after a cribbing or weaving session.

The repetitive motion causes a temporary sedating effect (calming his nervousness or frustration); the horse becomes addicted to his own internal chemicals. The weaver gets his “fix” by going through repetitive behavior. In experiments at Tufts University, animals with compulsive behavior such as weaving and cribbing were given narcotic-blocking drugs that neutralize endorphins, and the animals stopped their repetitive activities while these drugs were in effect. Since the endorphins no longer were produced (no more feelings of well-being and pleasure), the horse lost his desire to crib or weave.

Further Studies

Dr. Nurnberg and associates at the New Mexico School of Medicine did a study a few years ago involving a horse who weaved, looking at it from a psychiatric point of view. “People thought these animal behaviors might be animal models of obsessive-compulsive disorder in humans. I have horses myself, and have been interested in weavers and cribbers, so we did a study and published a paper in 1997 (‘Consideration of the Relevance of Ethological Animal Models for Human Repetitive Behavioral Spectrum Disorders,’ published in *Biological Psychiatry*),” he says. The study examined the possibility of using ethologic (naturally occurring) animal models for learning more about treating humans with similar disorders, determining which drugs might be most effective.

“Weaving is a repetitive, constant, purposeless behavior that seriously compromises the health and value of some horses. According to an Italian study, weaving occurs in 2 1/2 percent of the equine population, with a heritability factor

of 26 percent, which is huge. The genetic component is a big factor," says Nurnberg.

"The 26 percent figure was based on maternal genetics alone; horse people will generally tell you what's wrong with the mare but are reluctant to tell you what's wrong with the stallion because they want to keep breeding him. So when you get a number like 26 percent, just based on maternal lineage—without even looking at the sire's side—you know the genetic factor is a lot bigger than this. There are definitely certain types of horses who are more prone to weaving, cribbing, etc. It's a function of temperament—which is very much genetically determined—in combination with environment (confinement)," he explains.

There's a lot of selective breeding that factors in, putting these genes together, says Nurnberg, "a much higher rate than you would get naturally—as in Thoroughbreds and competitive Quarter Horses bred for speed events. This tendency will come out in any type of horse who is more hyper to begin with. Then you feed them a high grain ration, and they are really wired!"

Because of successes in treating stereotypic behaviors using narcotic antagonist drugs (Dodman's work) and more recently using serotonin reuptake inhibitors (studies by J.L. Rapaport in dogs), Nurnberg decided to examine efficacy of these agents in equine weaving. He tried three different agents (separately, and in sequence) to selectively probe serotonin, endogenous opioid (produced by the horse's own body), and dopamine neurotransmitter systems.

"We found a horse who was a very bad weaver, whom the owners were going to put down—a 10-year-old Thoroughbred mare who had been weaving for five years. The condition began gradually but progressed to be persistent and severe—to the extent that the horse was unable to keep on weight, not trainable, and dangerous to be saddled or ridden alone," says Nurnberg.

"The owners allowed us to try drug treatments. We were doing studies with those drugs in people, so I wanted to do a study with this horse. The mare was treated in her natural environment. She had her own open stall area, next to and in full sight of four stable mates. The five horses spent their daytime hours together in a large pasture. Individual horses were separated from the group when ridden or worked. With the exception of this mare, this regime created no problems. In the evening, the horses were brought into their individual stall areas to be fed and to remain there for the night," he says.

The first drug tried was Paroxetine, a selective serotonin reuptake inhibitor (SRI), a Prozac type of drug used to treat depression and obsessive-compulsive behavior in humans. "The horse was videotaped before the medication was begun, and then for 15 minute intervals per hour, four hours each week, in a four week trial."

Then the horse was given a month without treatment, to allow all the drug to leave the body, before starting the next trial. Naltrexone, an opiate antagonist was used next—a drug used in humans to help treat alcohol dependence and narcotic addiction. The horse was videotaped at the beginning, and then weekly for a four week trial—15

minutes every hour for four hours each week of the trial, right after the daily oral medication was given.

"After another four-week washout between drugs, the third agent, acepromazine (an effective dopamine antagonist phenothiazine tranquilizer used in horses) was administered at a standard equine dose of 30 milligrams intramuscularly. This drug is similar to Haldol, used in human medicine as an antipsychotic agent, to treat mental disorders such as schizophrenia, and is also prescribed to control tics (uncontrollable muscle contractions). This is actually an antidopamine drug, and dopamine is theoretically the basis of stereotypies," says Nurnberg.

"The horse was again videotaped before receiving medication, and then for 15 minutes every hour for four hours," says Nurnberg. The videotapes were analyzed by two raters who were unaware of the study condition. Their job was just to count the total number of head swings—recorded at three minute intervals for eight measurements in each condition. The three minute counts were then averaged. Observers also measured the time it took the horse to begin weaving, along with their impressions of the animal's demeanor (ability to stop, intensity of fretting, kicking out, biting, etc.).

"Thus we tested three brain systems, and the horse actually did remarkably well on the SRI, with more than 95 percent symptom reduction. They didn't do very well on the Haldol (acepromazine), with just 30 percent reduction, and 40 percent reduction on the Naltrexone. With the SRI, the horse was able to stop weaving entirely for extensive periods of time. When the horse was stressed by removing the dominant female of the group from view, the weaving behavior returned within five minutes, but was reduced in severity. The stress of separation also promptly exacerbated the weaving with the other two drug treatments as well," he says.

The SRI, an established treatment for obsessive-compulsive disorder in humans, showed a potent effect on equine weaving behavior, says Nurnberg, but the fact that the other drugs also helped (though in lesser degree) indicates involvement of more than one brain system in this condition. More studies are needed for further evaluation of these complex and interactive systems.

The main purpose of this study, he says, "was not to define new treatments for weaving, but to support a growing interest in looking at naturally occurring animal behavioral disorders for psychiatric research—quite welcome at this time of intense political pressure against animal laboratory research from animal rights groups. Any opportunity to explore animal behavior (such as equine weaving) with a similarity to human psychiatric conditions, that also demonstrate genetic influences, common neurobiological foundations and common pharmacologic responses, should not be neglected. Animal research remains a cornerstone of scientific medical progress, with important potential applications for psychiatry," he says. It may also give horsemen more knowledge in how to deal with some of these problems.