

# Causes, risks of colic explained

*Decreasing farm and horse risks with appropriate management has decreased the incidence of colic on farms with elevated annual colic rates.*

By **JOE D. PAGAN\***

**O**F all the problems associated with feeding horses, colic (defined as any abdominal pain) is by far the most prevalent. There are a multitude of different causes of colic, but feeds or feeding management are often implicated as primary factors.

At the 2006 American Association of Equine Practitioners (AAEP) convention held last December in San Antonio, Texas, Dr. Nat White of the Marion duPont Scott Equine Medical Center in Virginia presented a comprehensive series of lectures related to causes and treatment of equine colic.

This article is a brief summary of one of White's presentations. The proceedings of this meeting are available from AAEP at [www.aaep.org](http://www.aaep.org).

## Prevalence

Colic is very common in horses. Out of every 100 horses in the general U.S. population, 4-10 cases of colic are expected during each year. The annual number of colic cases, however, may vary greatly between farms, ranging from 0 to 25 or 30 cases per 100 horses. Between 80 and 85% of colic cases can be designated as simple colic or ileus because no specific diagnosis is identified, and most horses respond to medical treatment or resolve spontaneously.

In one study, approximately 30% of horses with colic were identified by owners but never examined by a veterinarian because the colic was transient or resolved with treatment by the owner. Colic is responsible for more deaths in horses than any other disease.

In the normal U.S. farm population, horse mortality from all types of colic is 0.7 deaths per 100 horse-years, with a colic case fatality rate of 6.7%. The predominant reasons for death are stomach rupture, strangulating lesions or enteritis. The large colon is the most commonly affected section of the digestive tract, followed by the small intestine, cecum and small colon. The value of horses lost due to colic in the U.S. in 1998-99 was esti-

mated at \$70 million, while the total cost of colic to the industry was estimated at \$144 million.

Based on smaller studies and anecdotal information from veterinary hospitals, the number of abdominal surgeries performed on horses with colic in the U.S. is estimated to be 12,000-24,000 annually, or possibly as many as 2.7 colic surgeries every hour.

## Risk factors

Risk of colic is defined as the odds that colic incidence will increase in a group of horses exposed to a particular factor compared to the colic incidence in a group that is not exposed to that factor.

Horses that have had a previous episode of colic are three times more likely to have a second colic episode compared to a horse that has never had colic. In other words, if the incidence of colic in a normal population of horses with no previous history of colic is 10 out of 100 horses in a year, the rate of colic in a population of horses with a history of colic would be 30 out of 100 horses per year.

**Breed and age.** While colic may affect horses of any breed, several studies sug-

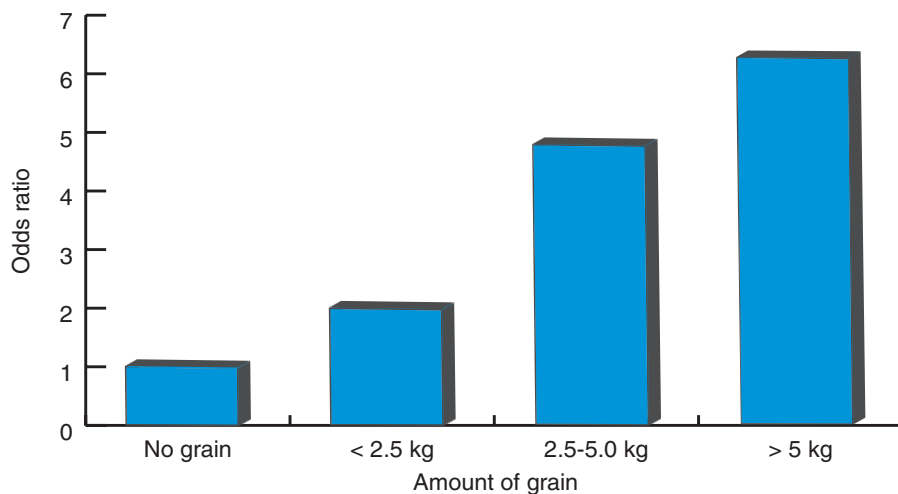
gest an increased incidence of disease in Arabian or Thoroughbred horses. Younger horses (younger than two years) and older horses (older than 10 years) appear to have a lower risk for simple colic. Middle-aged horses are at higher risk of colic than older horses; however, older horses with colic are more likely to require surgery.

**Diet.** Feeds or feeding activity have long been associated with the incidence of colic, though information is still largely anecdotal. Coarse forage with low digestibility or particularly coarse fiber is associated with impaction colic. Poor dentition has been proposed to predispose horses to colic due to poor mastication of food, although this has not been confirmed.

Grain overload increases the risk of colic and laminitis. Feeds such as lush clover and lush pasture have been implicated as causes of tympany. Horses fed poor-quality bermuda grass hay have an increased risk of ileal impaction, and anecdotal reports suggest that some horses have more colic when fed alfalfa hay. Feeding from hay in round bales is also associated with an increased risk of colic.

Studies indicate that increased amounts of grain or changes in the type of hay and grain fed increase the odds of colic compared to horses without grain or changes in feed. Daily feeding of concentrate at 2.5-5.0 kg per day and more than 5 kg per day to adult horses increased the risk of colic 4.8 and 6.3 times, respectively, compared to

## Odds of colic



horses fed no grain (Figure).

At one stud farm, horses fed grain in the form of pellets or sweet feeds had an increased risk of colic compared to horses that were not fed grain or were fed single-grain diets. Grain diets decrease the water content of ingesta in the colon due to a decrease in fiber, which binds to water. Grain in the diet also increases gas production and is more likely to create an intraluminal environment that favors gas production or altered motility leading to displacements.

Feeding small amounts of grain at frequent intervals reduces fluid shifts in the large colon compared to fluid shifts that occur with twice-daily feeding of larger quantities of concentrate. Although no relationship was found between feeding frequency in one study, feeding more than twice daily increased the risk of colic in a Virginia-Maryland study. This increased risk was thought to be due to an

increased daily intake of grain rather than the frequency of feeding.

### **Colic prevention**

Two types of factors should be considered when trying to prevent colic: farm factors and horse factors. Farm factors include management, use, feeding and environment. The associated risks on farms with high rates of colic include poor parasite control, high concentrate levels in the diet, multiple sources of concentrates (including supplements that contain high amounts of soluble carbohydrates), chronic water deficiency, excessive use of non-steroidal anti-inflammatory drugs, acute changes in hay or grain diet and horses in training that are confined and fed large amounts of carbohydrate and lesser amounts of roughage.

Decreasing these risks with appropriate

horse management has decreased the incidence of colic on farms with a higher-than-average annual colic rate.

Based on these known factors, colic prevention should start by making sure horses have a constant source of fresh water, ensuring that forage makes up at least 60% or more of the diet and that concentrates (soluble carbohydrates) are fed at the minimal level required to maintain weight and performance. Turn-out and exercise routines should be regular and consistent. Changes in feed should be completed over a 7- to 10-day period, and parasite control must be optimal.

\*Dr. Joe D. Pagan is president and founder of Kentucky Equine Research Inc., which, through consultation and research, aims to bridge the gap that may exist between basic research and horse production.