

Offer a Carrot and Call Me in the Morning: Nutrition for the Equine Invalid

BY ROBIN STANBACK AND PETER HUNTINGTON, BVSc

Horses recovering from colic, surgery, high fever, or colitis can present many challenges for their owners, but one that is frequently overlooked is how to feed horses through the illnesses. While countless researchers have devoted years of study to determine the proper nutritional balance for horses of different ages and workloads, little has been done to outline proper nutrition for the sick adult horse.

One of the factors limiting this type of research is that the elements causing the horse to be an invalid attract the lion's share of medical attention. Nutritional support becomes a secondary concern when a horse is suffering from a broken leg, a resection of the bowel, or a severe dystocia. At the 2000 Equine Nutrition Conference for Feed Manufacturers presented by Kentucky Equine Research, Dr. Ray Geor stated that the interest in the effects of nutritional interventions for horses had been increasing, but "there have been no con-

trolled studies of the relationship between nutritional support and clinically important end points such as surgical complication rate, duration of hospitalization, and mortality."

Large veterinary clinics and university hospitals would be natural bases for this type of research, but to be valid, the studies would have to carry with them restrictions and controls that may be impractical in clinical situations using client-owned horses. Dr. Fairfield Bain of Hagyard-Davidson-McGee and Associates in Lexington, Kentucky agreed that research into proper nutrition for the equine invalid has been limited. He stated, "We know from studies done in human medicine and some done on smaller animals that nutrition can play a significant role in returning a patient to good health. Some of that knowledge has been used by veterinarians to treat animals, but there is a real need for species-specific research."

Small animal practices tend to follow the old adage, "If the gut works, feed it." In horses, that belief tends to be adhered to as well. Dr. Bain added, "If the horse comes to us with a healthy appetite, we tend to keep him on the diet that appeals to him whenever possible. Problems arise when a horse will not or cannot eat, or when that horse is eating, but is not maintaining its weight."

There are many reasons horses may have difficulty maintaining weight. Dr. Kathleen Crandell and Mark Llewellyn, in a series of articles in *Equine News*, Volume 3, Issues 3 and 4, covered some specific causes such as liver and kidney disease and chronic obstructive pulmonary disease. Other problems such as parasite infestation and dental occlusion can be corrected easily.

For those horses that cannot or will not eat, different challenges face the attending veterinarian and the horse owner. Research done by Dr. Jonathan Naylor in Saskatoon, Saskatchewan, Canada has shown that feed deprivation for three to five days severely compromises cellular and non-specific immune function, which can render the animal more susceptible to infection and other postoperative problems. The horse fares best when it is able to continuously graze. Many have adapted well to human interventions that limit the times when feed is available, but illnesses can throw off



Photo by Robin Stanback

Feeding Strategies for the Equine Invalid

- **Make changes to feeding programs slowly.**
- **Take familiar feeds with the horse to the veterinary clinic.**
- **Alert the veterinarian to any changes that have occurred in the horse's diet.**
- **Assess the horse's energy needs during its recovery and adjust its feeding program gradually to match the needs.**

even the most carefully conceived feeding program. Dr. Naylor reports that anorexia is a common response to infections. Stress, pain, and some medications can contribute to a lack of appetite as can an ulceration of the stomach lining.

Dr. Bain explained, "For those horses that seem to have no interest in eating, a common practice is the use of the 'buffet approach.' We place everything we consider palatable and nutritious before them and hope something will

of a liquid diet delivered through a surgically implanted esophagostomy tube or a nasogastric tube. Currently, there are no commercially available liquid diets designed specifically for the horse; however, there are a number of nutrient-rich recipes that veterinarians can prepare. These include a careful balance of electrolytes, digestible energy, vitamins, and water and should be delivered in small frequent feedings at first. Horses on this type of a diet need to be carefully monitored for complications that can include diarrhea, colic, and laminitis. As the horse recovers, the buffet can be offered again and the patient can be gradually weaned from the liquid diet.

While it is possible to provide nutritional supplementation to horses intravenously, the cost is prohibitive and, according to Dr. Geor, a prolonged intravenous diet is associated with atrophy of the intestinal mucosa. However, Drs. Geor and Naylor suggest that glucose-containing fluids administered intravenously can provide considerable energy to the horse.

Certain problems require specific feeding regimens to ensure that the horse has the best possible chance of returning to good health. Dr. Alfred Merritt of the Island Whirl Colic Research Center at the University of Florida has spent years researching the causes of and the best possible treatments for colic in horses. His feeding recommendations for horses recovering from colic surgery are based upon an intimate knowledge of the equine gut. He suggests, "Horses recovering from a resection of the small intestine do best on a diet that is high in fiber, while horses that have had a portion of their large colon removed do best on a grain diet supplemented with a high-quality alfalfa hay that is easily digested. Research has shown horses to be surprisingly adaptable when large sections of

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encourage them to eat." Suggested items for the buffet begin with young, leafy green grass as, according to Dr. Naylor, "It is palatable and digestible and may be preferred by horses that refuse other foods." The list progresses through alfalfa hay, grass hay, grains and grain mixtures, bran mashes, even carrots and apples, though their nutritional value is less than outstanding. The goal is to encourage the horse to eat. Dr. Naylor suggests offering the feeds in different places as some horses may be more interested in food placed on the ground while others might prefer it out of a manger or hayrack.

If nothing on the buffet entices the patient, or if certain surgical interventions or injuries to the head or neck have rendered it impossible for the horse to consume feed in a normal fashion, nutrition can be provided in the form

either the small intestine or the large colon have been removed. Careful feeding would only ensure this."

Another important factor in colic cases, according to Dr. Merritt, is the effect of fluids. He continued, "Keeping the horse hydrated is vital, but recent research has shown that horses may benefit more from large amounts of water provided by mouth as opposed to intravenously. Veterinarians often recommend that horses recovering from impaction colic be allowed to eat plenty of green grass; others advocate the use of bran mashes. Is it the water in the green grass and the mash that acts as a laxative? This is still a gray area, particularly where the mashes are concerned, but we do know that fluids are essential, and if the horse will eat the grass or the bran mash and absorb the fluids, then it will be better off."



New Technology Provides an Inside Look at the Equine Digestive Tract

BY GEMMA COWLEY

Every horse owner fears colic. The gastrointestinal tract of the horse is a dynamic and convoluted passageway that is susceptible to a multitude of insults. While most horse owners deter colic by maintaining sound feeding and management practices, even the most careful will encounter a colicky horse at one time or another.

Dr. James Moore and a team of researchers at the University of Georgia developed *The Glass Horse*, an innovative CD-ROM that uses text, audio, and three-dimensional animations to clearly and concisely help veterinarians, students, and horse enthusiasts grasp the

important anatomical features and disease processes of the gastrointestinal tract. Dr. Moore stated, "To truly understand the equine digestive system, you have to accept the fact that it was very likely designed by a committee! For most of us, developing three-dimensional images of this complex organ system based on two-dimensional drawings typically found in textbooks was not a skill that came naturally."

The program illustrates digestive organs individually and collectively. When developing *The Glass Horse*, researchers paid strict attention to maintaining the relative sizes of organs. Additional internal organs such as the ribcage, pancreas, liver, and kidneys serve as anatomical landmarks. *The Glass Horse* also portrays the abdominal structures from different vantage points by allowing the user to rotate the images 360 degrees. Operators can also visualize the organs that can be palpated during a rectal examination under normal and pathological conditions. Employing computer animation, *The Glass Horse* demonstrates common intestinal displacements.

The creators used some of the most advanced technology on the market to develop the CD-ROM, including the same software that was used to create the motion picture *A Bug's Life*. Even so, few system requirements are needed to run the program. *The Glass Horse* uses Quicktime Movies, a free program for Windows or Macintosh computers that can be obtained at www.quicktime.com, as a platform. The basic system requirements are a Pentium II processor (or greater), a sound card, and a CD-ROM drive. For more detailed requirements, to view more images from *The Glass Horse*, or to purchase the program, log on to www.3dglasshorse.com. ■

While green grass is a recommendation of another veterinarian renowned for her experience with broodmares, Dr. Michelle LeBlanc of Rood and Riddle Equine Hospital in Lexington, Kentucky stated, "For broodmares recovering from a dystocia, our nutritional advice depends greatly upon whether the mare goes home with a baby by her side or not. If the mare has a foal by her side, she will continue to need a diet rich in energy so that she can produce milk for the foal. She can be returned to her normal diet fairly quickly. However, if she goes home without a foal, she will need to have her feed adjusted, as she will not have as high a demand for energy. This needs to be done carefully. No alteration in a feeding program should be done quickly."

Dr. LeBlanc's remarks mirror those of Dr. Bain who agreed that changes to a diet should be made gradually. He too highlighted the need to adjust a diet to reflect the needs of the horse as it recuperates from an illness or surgery. He said, "An equine athlete recovering from arthroscopic surgery will require stall rest followed by limited turnout. This horse will need to be placed upon a diet that takes into account the change in his energy requirements."

A nutritional evaluation should be done for horses recovering from surgery or illness. Dietary changes are recommended for laminitic horses and those suffering from the effects of old age, Cushing's disease, respiratory prob-

lems, and hepatic disease. In each case, a carefully balanced diet rich in specific minerals and vitamins should be designed to provide the horse with the best possible nutrition for its recovery and future health. For instance, a horse recovering from laminitis would benefit from a diet featuring more forages than grain, but this horse would also benefit from a combination of supplements including biotin, zinc, and methionine.

Long-term antibiotic use has been linked to vitamin K deficiencies. This vitamin is required to activate plasma-clotting factors. Vitamin E is essential for the integrity and optimal function of muscular, circulatory, nervous, and immune systems, and it also acts as a natural antioxidant. It is a vitamin that, while abundant in immature forages, diminishes with maturation and harvesting. Vitamin E can easily be added to the diet in the form of vegetable oils. Research has indicated that chromium supplementation may have a positive impact on horses known to have chronic problems with tying-up. We can help horses recover from illnesses and injuries by paying careful attention to their nutritional needs. Diets designed to maximize equine performance and reproduction are carefully researched and scrupulously followed. The knowledge gained from some of this research can be used to help horses recover from illness and injury. Nutrition needs to be a part of the healing program. ○○