



KER Nutrition Conference

By Mark Llewellyn



Kentucky Equine Research (KER) has maintained a prominent international presence in the nutrition research community for the past 20 years. Research trials have been conducted at the company's research farm since the late 1980s, and results of this research have been published in numerous peer-reviewed journals and proceedings of scientific conferences. More importantly, findings from these studies have been put to use in the formulation of feeds for KER's global network of feed manufacturers. The

KER Nutrition Conference, held on the 16th and 17th of April in Lexington, Kentucky was attended by 130 guests, including feed manufacturers, sales representatives, veterinarians, nutritionists, and academics from 16 countries. This year's conference focused on the management of gastrointestinal and metabolic diseases.

Founder and President Dr. Joe Pagan began by introducing Dr. Larry Lawrence, senior nutritionist at KER, who presented an in-depth review of the development of the gastrointestinal system. Dr. Lawrence addressed the changes that occur as a foetus grows within the womb and as the foal matures and begins to digest a diet of forages and concentrates. A thorough explanation of the physical, enzymatic, and fermentative changes that occur to the gastrointestinal tract during gestation and growth gave conference attendees a better understanding of the importance of proper feeding.

Colic, the most pervasive disease of the gastrointestinal tract in horses, was the next topic of discussion. Dr. Nathaniel White, the Jean Ellen Shehan Professor and Director at Virginia Tech's Marion duPont Scott Equine Medical Center and a world-renowned expert on equine gastrointestinal disorders, reviewed the prevalence of colic in today's equine population. He mentioned several risk factors: breed and gender predilection, dietary management, and

other environmental and management practices. Additional risk factors such as previous colic episodes, parasitism, cribbing, gestation, transport, and anesthesia were touched on as well. In addition, he chronicled measures to prevent the syndrome.

In a related lecture given later in the day, Dr. White addressed standard treatment protocols for colic including decompression of the stomach or intestine, use of systemic analgesics, strategies to promote gut motility and hydration, and treatment of impactions. He then discussed proper nutrition of the horse after an episode of colic. A review of enteral (traditional) and parenteral (intravenous) nutrition followed. The speaker noted that although enteral nutrition is preferred, parenteral nutrition can provide long-term nutritional support, and stated that horses have been kept on complete parenteral nutrition for up to a month and have been able to maintain or gain weight.

Dr. Frank Andrews, section chief of the department of large animal clinical sciences

at the University of Tennessee College of Veterinary Medicine, spoke about the diagnosis and treatment of gastric and colonic ulcers in horses. Gastric ulcers have been studied for several years and their prevalence among horses is well documented. Though colonic ulcers occur less frequently than gastric ulcers, Dr. Andrews listed several nonspecific signs including mild intermittent or recurring colic, lethargy, and partial anorexia that may hint at a problem. As the problem worsens, so do the signs with complete anorexia, fever, diarrhoea and associated dehydration, and weight loss is common.

Dr. Peter Huntington, the director of nutrition for KER's Australasian branch, spoke to conference attendees about recent advances in laminitis research. Despite the fact that a complete understanding of laminitis and its complex pathophysiologic processes remains elusive, laminitis seems to occur as a consequence of inflammatory, vascular, and enzymatic interactions. Dr. Huntington explained that a trend in

laminitis research involves interest in metabolic or endocrine events that lead to laminitis. In regard to prevention, Huntington pointed out that genetic research could identify at-risk horses, and therapies such as intracecal buffering are helpful in preventing the shifts in cecal pH that can lead to laminitis.

In closing the first day of presentations, Dr. Joe Pagan spoke about gastrointestinal health, the foundation of which, he made clear, is good-quality forage. He identified four primary factors that affect forage quality: plant species, stage of maturity at time of grazing or baling, latitudinal effects (tropical versus temperate forages), and inhibitory substances that reduce digestibility of fibre and minerals.

The buffering capacity of certain forages is a burgeoning area of interest among equine nutritionists. Pagan explained that certain feeds and forages can counteract changes in gastric pH, thereby playing an important role in the prevention of gastric ulcers in horses. This ability to resist changes in pH is called buffering capacity. Alfalfa hay has been shown to be effective in reducing the severity of gastric ulcers by providing superior buffering capacity when compared to grass hay.

The second day of the conference featured several topics related to metabolic conditions. Dr. Anna Firshman, a large animal internist at Oregon State University, began the day with a thorough overview of insulin resistance, a problem that has been receiving much attention recently as it is thought to be closely associated with other diseases such as equine metabolic syndrome, equine Cushing's disease, laminitis, hyperlipidemia, and osteochondritis. Firshman reviewed the mechanisms of glucose transport in muscle and fat, and then described the tests that are currently available to assess insulin resistance in horses. Firshman concluded that though tests may become useful clinical means to assess the degree of insulin resistance and responses to treatments, there is no one ideal test that is both practical and accurate.

Dr. Frank Andrews then settled onto the stage for a second presentation. He presented a detailed outline of the metabolic-related conditions that most commonly affect horses: equine Cushing's disease and equine metabolic syndrome. For each condition, he methodically outlined the clinical signs,

diagnosis, course of treatment, and management goals. For equine Cushing's disease, Andrews stated that diagnostic tests, when coupled with clinical signs, will confirm the presence of advanced disease but may not be sensitive enough to detect early stages of the disease.

KER has been instrumental in developing ideal growth curves for equine athletes. Dr. Clarissa Brown-Douglas reviewed the research compiled by KER over the last two decades, stressing the importance of properly feeding young, growing horses. To fuel maximum growth, breeders often feed young horses large amounts of grain. However, rapid growth achieved by overfeeding energy has been implicated in developmental orthopedic disease (DOD). The source of energy may be important for many young horses. Those that experience an exaggerated and sustained increase in circulating glucose or insulin in response to a grain meal might be predisposed to osteochondritis dissecans (OCD). Research conducted by KER suggests that hyperinsulinemia may influence the incidence of OCD. Based on the results of this research, young horses should be fed concentrates that produce low glycemic responses such as feeds in which energy is provided by fat and fermentable fibre sources (beet pulp and soy hulls).

Once the audience had an understanding of the metabolic disorders that affect horses, Dr. Joe Pagan identified a commonality among them. All of the problems are either triggered or aggravated by excessive starch and sugar intake. After a brief review of carbohydrates in horse feeds, Pagan gave general feeding recommendations for each disorder, noting that high-fat, low-starch feeds are appropriate for certain disorders such as tying-up but may not be recommended for others such as equine metabolic syndrome. Once a horse has been diagnosed with a metabolic disease, an equine nutritionist and veterinarian should team up to formulate a suitable diet.

Maintaining appropriate body condition is usually a trick for those who own horses diagnosed with a metabolic condition. These horses are often too thin or too fat. Dr. Laurie Lawrence, a professor at the University of Kentucky, addressed energy balance and methods to increase or decrease body condition. She presented reasonable timelines for weight gain and emphasised

management programs that allow ample time for weight gain so horses are not fed extremely high levels of concentrate. Lawrence also noted that as a horse is adapted to a diet with increased feed intake, there may be a fairly immediate increase in body weight due to changes in gut fill and/or gastrointestinal tissue mass, followed by a period of slower body weight change. Change in condition score will frequently lag behind change in body weight. Lawrence classified obese horses into two groups: those that have become fat temporarily because of a change in management or food availability, and those that have been fat for a long time. Adjusting the body weight of the first group, Lawrence explained, is usually much less complicated than reducing the body weight of the latter group, and she gave a step-by-step approach to helping these horses lose weight.

Kathryn Watts of Rocky Mountain Research and Consulting in Colorado gave the final presentation of the conference. She explained differences in the nonstructural carbohydrate (NSC) content in various forages, and how stage of growth and environmental factors might significantly alter the amount of NSC present. Watts advised that all of the most commonly recommended varieties of grass have the potential to contain high levels of NSC under certain conditions, but stands of these grasses can be managed for lower NSC concentration.

This year's Kentucky Equine Research Nutrition Conference offered valuable information about gastrointestinal and metabolic problems affecting horses today. For those individuals unable to attend the KER conference, proceedings are available by logging on to www.shop.ker.com. This 150-page booklet contains a detailed paper for each of the lectures presented.

As part of its dedication to world-class nutrition, KER has been recruited to help formulate and distribute feeds for the equine athletes of several international competitions. In 2004, KER was named the official nutritionist of the United States Equestrian Federation. In this capacity, KER nutritionists use their knowledge to sort out nutritional challenges encountered by the world's most elite equine athletes, those that represent the United States in international competition. For more information on KER, visit www.ker.com. ■