

Kentucky Equine Research welcomed more than 250 feed manufacturers, horse owners, veterinarians, and farm managers from a dozen countries to its fifteenth fall conference, held in Lexington in October 2006. Expert lecturers in the fields of mare and foal nutrition, growth-tracking software, and exercise regimens were ready to share their knowledge. Also on hand were specialists and veterinarians experienced in detecting and treating lameness and disease in young horses. To top off the program, attendees were given a peek, at least verbally, at the newly revised NRC equine nutrition guidelines. The schedule promised something for everyone, and judging from the questions and comments fielded by the KER staff, all delegates took home plenty of information they could use.

Kentucky Equine Research Nutrition Conference 2006: Factors Affecting the Production of the Equine Athlete

If Mama Ain't Happy

Healthy foal growth and development starts with proper nutrition of the pregnant mare. Maternal nutrition, genetics, and the uterine environment determine the size of the foal at birth, while growth of the young foal is closely related to the dam's milk production. Broodmare diets are important because fetal energy metabolism is glucose-dependent, and the maternal-to-fetal blood glucose concentration gradient is the most important factor for supplying energy. KER's Dr. Larry Lawrence reported that some effects of maternal nutrition can be seen in the foal's growth record up to a year of age.

Bringing Up Baby

Dr. Joe Pagan presented results of several studies related to the growth and skeletal development of Thoroughbred foals from around the world. In a study designed to assess the influence of month of birth, season, and gender on body weight, condition score, and daily weight gain, month of birth was shown to affect the growth of suckling foals. Those born in winter months were smaller at birth and grew more slowly during the first two months compared with spring-born foals. When pasture availability increased in the spring, winter-foaling mares supported faster growth rates in their foals than later-foaling mares. These faster growth rates in winter foals at 3 to 4 months of age may be due to greater milk production, greater pasture intake by the foals, or a combination of both.

Pagan emphasized the importance of achieving a balance between maximal growth and skeletal soundness. While a young horse reaches 94% of adult height in its first year of life, bone mineral content lags behind this rate. A yearling has achieved only 76% of its bone mineralization, and maximum bone mineral content is not reached until a horse is six years old. Pagan emphasized that a slow, steady growth rate is generally the most desirable in avoiding developmental problems.

Look How You've Grown!

Dr. Stephanie Valberg reported on the various adaptations occurring in skeletal muscle as young horses grow. At birth, equine muscle contains a high glycogen content, and mare's milk provides a rich source of sugar for energy metabolism. During the first years of a horse's life, there is a shift in muscle fiber type proportions in favor of type 2a fibers at the expense of type 2b fibers. There may also be a gradual increase in the oxidative capacity of type 2 fibers as the horse moves from sprinting (a survival factor for newborn foals) to enhanced staying power and a slightly slower speed of muscle contraction in the mature horse. Valberg stated that training begun



Mark Jewell

What factors could make this foal a champion? Those horsemen that attended the KER Nutrition Conference were privy to the latest findings in many areas of young horse management. The conference is open to everyone. The only requirement: a strong desire to properly manage horses.

at less than a year of age does not seem to hasten the changes that occur naturally with growth. Training begun at 18 months to 3 years of age appears to be more effective in developing equine athletes.

Where Are You From?

A presentation by Dr. Clarissa Brown-Douglas of KER contrasted foal size and growth trends among horses born and raised in America, England, Australia, New Zealand, and India. Although genetic makeup is similar for all populations, feeding programs and other management practices lead to differences in size at birth and maturity. In a KER study, Australian Thoroughbreds were found to be significantly heavier and taller at 7 days and 18 months of age than Thoroughbreds in all other countries. English Thoroughbreds were significantly lighter than in all other countries except India between 7 days and 4 months of age. At 4 months of age there were no significant differences in foal body weight between countries, with the exception of foals in India, which were significantly smaller.

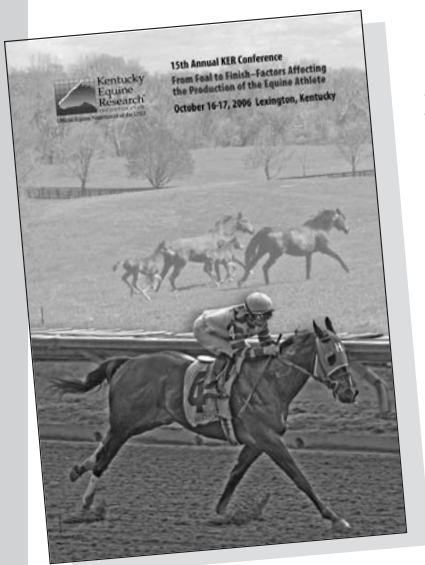
Gotta Keep On Moving

Dr. Chris Kawcak summarized results from a study designed to determine the effects of exercise at an early age on musculoskeletal tissues in the horse. The researchers tested the hypothesis that imposed exercise early in a horse's life



Bernd Ebert and Dr. Eberhard Moll of St. Hippolyt, KER's Team Member in Germany, visited with Vanesa Silva Mesquita. Vanesa is co-owner of Team Member Equimix in Brazil.

would strengthen all tissues, possibly preventing tissue damage later in life. They found that exercise beginning at 10 days of age did not have a detrimental effect on clinical, histologic, and biochemical parameters of musculoskeletal tissues. Exercise provided benefits to articular cartilage and also induced a significant increase in bone formation rate at 8 months of age. However, when compared with a control group of horses at 18 months, the overall effect was minimal, possibly because control horses regulated bone development through normal pasture exercise and growth.



Get all the Facts!

If you were unable to attend the Kentucky Equine Research (KER) Nutrition Conference, you can still get every bit of information presented by purchasing the official proceedings. This 140-page booklet is spiral-bound and contains an article written by each invited speaker. Many of the articles contain valuable reference lists. Proceedings are available for \$60.

Selected papers from past KER Nutrition Conferences are compiled in *Advances in Equine Nutrition I, II, or III*. These papers cover a broad range of topics and contain a wealth of information related to equine nutrition, veterinary medicine and exercise physiology. Included is a mixture of original research and review material as well as a great deal of practical information about how to feed and manage all types of horses. The fully indexed text should prove to be an essential reference for anyone interested in the latest developments in equine nutrition. *Advances in Equine Nutrition I, II, or III* are available as hardcover books or searchable CDs.

To place an order, contact Kentucky Equine Research at 1-888-873-1988 or info@ker.com.

What's the Matter With You?

Accidents, injuries, skeletal problems, and bacterial or viral ailments can negatively impact growth and development. Dr. Wayne McIlwraith explained that developmental problems related to the skeleton may have multiple causes including genetic predisposition, rapid growth, mechanical stress and trauma, and defects in blood supply. In addition, nutritional imbalances and endocrine disruptions may be causative factors. McIlwraith pointed out that early diagnosis and treatment can lead to positive outcomes in many cases of orthopedic disease. Radiography, computed tomography, magnetic resonance imaging, nuclear scintigraphy, and synovial and serum biomarkers can aid practitioners in pinpointing skeletal problems with a high degree of accuracy that was not previously possible when clinical examination was the only diagnostic tool.

Dr. Bill Bernard outlined common diseases and neurologic problems of young foals. Treatment of the severely ill neonatal foal is primarily aimed at keeping the animal alive, with nursing care and nutritional support being of paramount importance. Parenteral nutrition may be needed for extremely ill foals. Older foals and weanlings that have better nutritional stores may not need as much energy intake, but nursing care is still important. Bernard emphasized that prevention of disease should be a primary goal for foals of any age.

See You at the Track!

As young horses begin race training, they move from pasture turnout at the breeding farm to a stall at the racing stable. The resulting changes in exercise patterns can lead to problems as training progresses, according to Dr. Pagan. Bone mineral content initially drops with stall confinement, and shin pain



A party from the Japan Bloodhorse Breeders' Association attended the conference as part of a project to improve nutrition and management on Japanese breeding farms. KER's Rich Decker accompanied veterinarians, feed company representatives, and the project director as they attended the conference, visited Bluegrass farms, and trained on current growth-tracking software.

("bucked shins") is a common result. These horses are still growing as well as performing intense exercise, so their ration must provide adequate energy as well as lysine and other key nutrients. The nutrient requirement of a two-year-old in training falls somewhere between that of a rapidly growing foal and a mature horse. However, many two-year-olds can do well on a feed formulated for adult performance horses, as the elevated level of intake required to meet their energy requirement will provide sufficient protein and minerals to support growth. Further research may reveal methods to regulate bone deposition and avoid bucked shins.

Is Bigger Always Better?


Dr. Brown-Douglas presented some surprising results from a study that collected growth and performance data from more than 3,700 Thoroughbred fillies and colts between 1996 and 2002. Data from this study suggested that tall (but not heavy) young growing horses are more likely to become successful athletes. Smaller horses were more likely to start as two-year-olds and have more career starts. However, elite performers—those that were stakes winners, graded stakes winners, G-1 winners, and millionaires—tended to be taller and heavier.

Looking Into the Future

For the last several years, ration formulations and evaluations have depended heavily on the 1989 edition of *Nutrient Requirements of Horses*. Dr. Laurie Lawrence led the committee that has extensively revised this manual, which will be published in the next few months. She shared comments on the revision, noting that significant changes have been made to the recommendations for pregnancy and growth. From now on, these new figures will be the basis for feed formulation and analysis.

After Hours

There was much more to the conference than nutrition lectures! Attendees had a chance to visit with representatives of other KER Team Member companies during coffee breaks, at a cocktail hour each evening, during informal dinner conversations, and in the hospitality suite. Many visitors also made time for tours of Bluegrass Thoroughbred farms, training sessions on updated Gro-Trac and Microsteed computer programs, meetings to customize sales floor kiosks, and trips to Keeneland Race Course (where at least one race-goer is rumored to have hit the jackpot).

The staff members of Kentucky Equine Research wish to thank all who attended the 2006 nutrition conference. You are cordially invited to visit us any time you are in central Kentucky! 



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