



PHOTOGRAPH | JEFF ROGERS

# Research

## Looking Deeper

*Twenty years of investigation*

Every horse owner has ideas about how to feed and care for his or her horses. Usually the plan includes advice from friends, suggestions from a veterinarian, tips gleaned from magazines or Internet articles, and a smattering of “how it’s always been done.” Each of these owners, however, probably wonders why the scheme doesn’t always produce superior results. Obviously, there’s a lot that isn’t known about how to feed horses.

Kentucky Equine Research’s mission over its first 20 years has been to delve into the finer

points of equine nutrition, using the results of its own research to design better feeds and feeding programs to promote healthy, sound horses that can perform to their maximum potential.

Asking questions is the first step in research. After a study is designed, carried out, and summarized, the findings will theoretically answer those questions. KER has uncovered a great deal of new information and has shared its findings to benefit horses and their owners.



PHOTOGRAPHS | MARK LLEWELLYN

### *A question of digestibility*

Horses eat grass, hay, and various types of grain. How well do they absorb nutrients from these feedstuffs, and can different feeding plans increase or decrease bioavailability? KER studies showed that:

- Yeast culture supplementation enhanced the digestibility of some nutrients.
- Chronic administration of a common antibiotic, sulfamethoxazole/trimethoprim (SMZ), did not affect the digestibility of calcium, phosphorus, magnesium, potassium, zinc, copper, or manganese.
- Selenium-enriched yeast supplementation provided better bioavailability and retention than supplementation with sodium selenite.
- Intake at 200% of daily requirement led to greatly increased retention for zinc and manganese, but oversupplementation of copper resulted in only a small increase in retention.

### *A question of exercise*

How long before exercise should horses be fed, and how do the nutritional requirements of strenuously exercised horses differ from those of idle horses? Research at KER found the following:

- After an overnight fast, horses had lower blood lactate and slower heart rate after exercise than horses receiving hay and grain before exercise.
- Horses receiving normal amount of B vitamins did not benefit from additional B-vitamin supplementation before exercise.
- Strenuously exercised horses may require more dietary chromium than idle horses.



PHOTOGRAPH | BECKY YOUNG

### *A question of fat*

When fat is added to the horse's diet, what effects are seen on digestion and metabolic response to exercise? Studies at KER revealed:

- Horses digest fat well, and digestibility of fat becomes more efficient after the horse has been eating supplemental fat for some time.
- Corn oil, dried fat, and rice bran can all be used effectively in rations for exercising horses.
- Feeding rice bran resulted in lower lactate accumulation and lower heart rates during exercise compared to feeding corn oil.
- Feeding a level of fat equal to about 9-10% of the daily grain ration causes no detrimental effects on either health or exercise response, and may help delay fatigue in horses exercising intensely for extended periods of time.



PHOTOGRAPH | BECKY YOUNG

### *A question of muscle disorders*

Dietary manipulation can prevent the signs of muscle disorders such as polysaccharide storage myopathy (PSSM) and recurrent exertional rhabdomyolysis (RER). KER research suggests:

- Diet has a significant effect on muscle metabolism, even when fed for a fairly short period of time.
- A high-fat, low-starch diet results in dramatically lower post-exercise creatine kinase activity in severely affected RER horses than does a low-fat, high-starch diet.
- For horses with clinical signs of PSSM, a diet with less than 5% digestible energy from starch and more than 12% digestible energy from fat can reduce tying-up by increasing the availability of free fatty acids for muscle metabolism.



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### *A question of healthy growth*

Breeders want young horses to grow quickly so they will bring high prices at weanling and yearling sales. However, extremely fast growth spurts are often followed by skeletal problems. What is a safe growth rate, and how can it be encouraged by dietary modification? Studies at KER showed:

- Foals weaned at five days of age and raised on a commercial milk replacer showed slower early growth rates, but by six months of age these foals were as tall and nearly as heavy as conventionally raised foals.
- In Kentucky, winter-born foals grew more slowly during their first two months but caught up to later-born foals by five months of age.
- Taller and heavier horses tended to bring higher bids at yearling sales. However, smaller and lighter horses had more starts as two-year-olds and

stayed sounder throughout their racing careers than their heavier peers.

- An uneven growth curve, with periods of restricted growth followed by spurts of development, tends to increase the risk of developmental orthopedic disease.
- Rates of OCD were greater when young horses were fed grain meals that produced a high glycemic response.
- Feeding and managing foals is a balancing act between achieving a commercially desirable level of growth and preventing skeletal disease.

Brief summaries of many Kentucky Equine Research projects are available online. Go to [www.ker.com](http://www.ker.com) and click on “Research” and then on “Recent Studies” to browse through protocol and results. 



## **Reprint Courtesy of Kentucky Equine Research, Inc.**

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