

How Do They Do That?

Feed Flavor Research Led to Surprising Findings

BY AMY JANE FITZGERALD

Editor's note: What exactly does "research proven" mean? At Kentucky Equine Research we take our job very seriously. When we say something is research proven, we can show you the research we have done to back it up. Now we would like to share with you just how and why we do it.

Many horse owners have experienced problems with dainty eaters and fussy feeders, those horses that turn up their noses at anything offered while their caretakers try desperately to encourage them to eat, keep their condition, and perform at their optimum. Whether the animal is an Olympic athlete or a trail-riding companion, maintaining a horse in peak form can be a never-ending battle. Research is continuously being carried out to provide solutions to this problem. One such solution is the addition of flavors to the daily ration to increase palatability. How can we tell with certainty that the horse prefers one flavor to another? Because the horse cannot express itself verbally, a system for measuring preference and variable factors was devised. At Kentucky Equine Research (KER), many of these variables have been taken into consideration in previous trials, and that information is used to build upon our base of knowledge.

Many horsemen assume that apple flavor is the best appetite enticement for a horse, so they might cut up apples and include them with the feed. A clever horse can sift through the feed, snatch the apple, and leave the rest. If cutting up the apple and blending it with the feed doesn't work, then perhaps a flavor additive would be a better choice. KER researchers posed this question in 1996 in the form of a research trial, and surprising results were obtained. Interestingly, apple flavor rated only mediocre among the equine taste testers, whereas cherry flavor proved to be the most appealing. This finding raised one serious question: Why would a flavor that is found in a tree with leaves that can be toxic to horses be so appealing to them? As is often the case, findings in this research study paved the way for other projects. In association with a flavor manufacturer, KER has continued to explore flavor preferences in horses.

Once the research topic has been clearly identified, KER researchers analyze information garnered from similar trials. Approaches that have been tried, along with the experience and knowledge of the researchers, are combined to set up the experiment in a balanced design. The feed flavor trial in 1996 was designed as a 4 x 4 Latin square two-choice test, a commonly employed design template for many research trials. It is especially suitable for feed preference tests. This design used eight horses, a number that provided enough data to be statistically relevant yet remained practical and economical. The eight horses were arranged into four sets of grouped pairs that rotated within four periods, hence 4 x 4. Each period was one week in duration.

KER expanded upon the 1996 project by investigating more variables in another recent project. This flavor trial explored how different horses with different routines reacted to the flavors in feed and more accurately simulated real-life situations. Thoroughbreds, Arabians, and mixed-breed horses provided a variety of subjects,



Photo by Jeff Rogers

and the individual characteristics of the horses provided the extremes that may be present in any barn. Two examples are Sly and Vinnie. Sly, the friendly family pet, is an equine vacuum that has rarely been stabled. On the other hand, Vinnie is an obstreperous character that needs to be handled with sensitivity. He's more accustomed to being stabled and has definite opinions.

The preference trial or decision-making stage for the horses consisted of two decisions each day. During the first period of the trial in 1996, Vinnie's preference test continued for three days (see Table 1). Once this was completed, he moved to the second, third, and fourth periods that offered teaberry, citrus, and apple feed flavorings, respectively. The other three pairs of horses rotated through the flavors in a similar manner, each group starting with a different flavor and working through them systematically.

During the trial, two buckets containing equal amounts of grain were simultaneously hung in the horse's stall. The buckets were of the same construction and color to avoid preference based on visual cues. One contained the flavored feed and the other contained an unflavored (control) feed or a feed with a different flavor. If more than two buckets were offered at any one time, the horse may have eaten from the nearest one, never reaching the buckets at the periphery of the row. In addition, the buckets were hung on a different wall from where the horse normally accepted its feed, and the conditions in the stall were maintained from one trial to the next. The horse was then allowed to eat from either bucket for a set amount of time, after which the feed remaining in each bucket was weighed and recorded.



Table 1. Feeding schedules and bucket arrangement for a horse during one period in the 1996 trial.

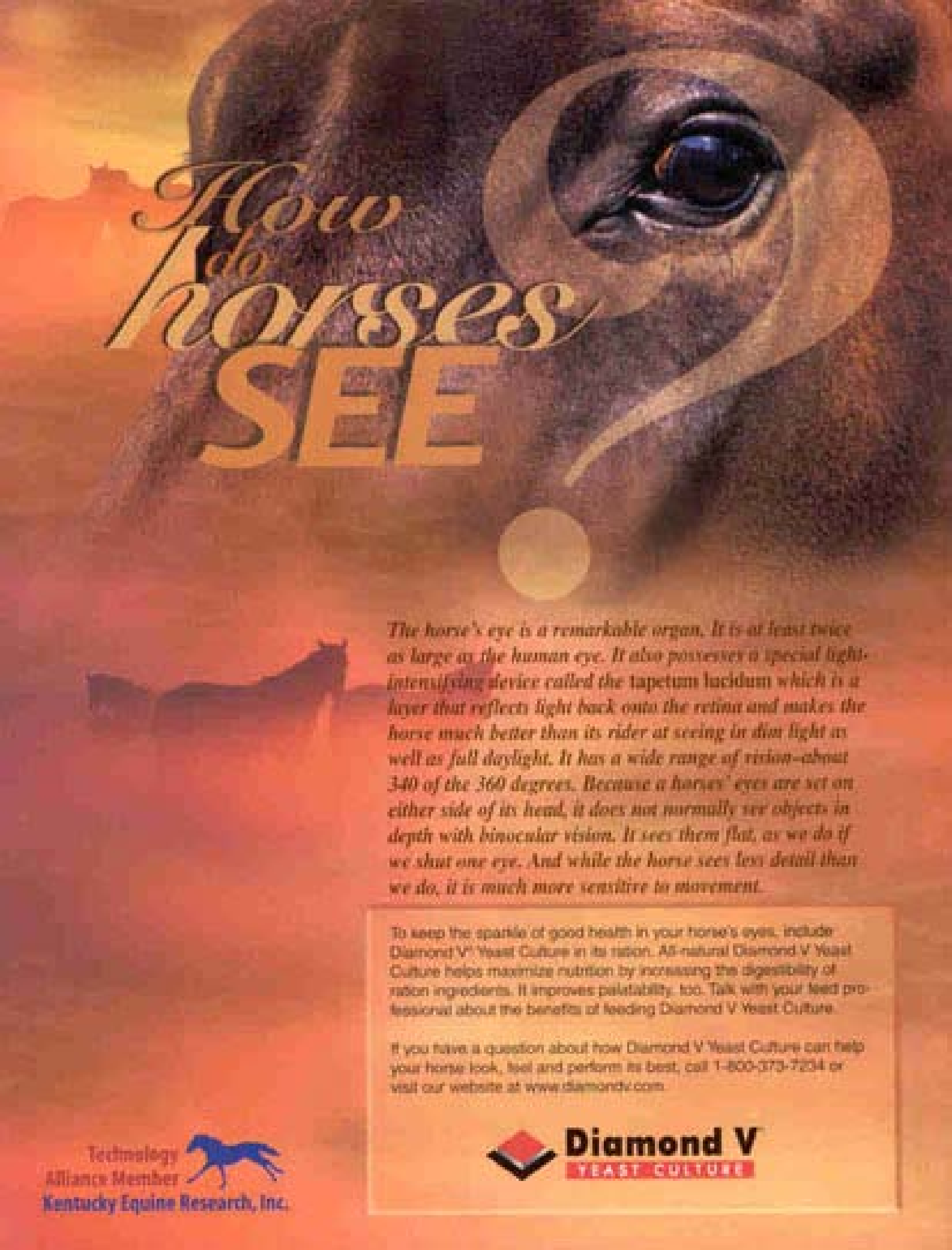
DAY	TIME	LEFT BUCKET	RIGHT BUCKET
1	AM	Cherry	Control
1	PM	Control	Cherry
2	AM	Cherry	Control
2	PM	Control	Cherry
3	AM	Cherry	Control
3	PM	Control	Cherry

Horses have finely tuned senses that were considered during the feed trial. Preference can be affected by the position of the doors and windows, the position of the research technician, the side on which the research technician was standing when giving the feed, the proximity of a wall, and a host of other factors. All external factors that might affect decision-making were removed. Visual and aural disturbances were minimized during the trial so horses did not feel threatened. Horses were monitored from a distance.

The basic feed that is mixed with the flavor is also developed carefully. We have discovered that flavoring does not always mix well with oats. Sweet feed contains a large amount of molasses that may mask the added flavor. KER researchers constantly experiment with substrates and concentrations of flavors to determine what combinations might work the best. Results from the trials and observations made by the research farm staff are incorporated to reach conclusions.

KER is often approached by companies that do not have extensive research facilities to help identify the suitability of a product they intend to release on the market. A flavor trial currently being investigated is one such case. "We are always happy to assist other companies explore products that might possibly help horses. Often, as is the case with this current project, the request closely mirrors research we were developing or builds upon research we have already completed," said Dr. Joe Pagan.

KER researchers are known for investigating questions about what horses really need to be healthy, productive, and athletic, but we are also searching for answers to the question of just what horses actually like. For the Slys of the world who will eat anything, perhaps this research will be moot, but for the Vinnies out there, it is our hope that we can discover the solution that will offer a meal they simply cannot refuse. ☺☺



How do horses SEE?

The horse's eye is a remarkable organ. It is at least twice as large as the human eye. It also possesses a special light-intensifying device called the tapetum lucidum which is a layer that reflects light back onto the retina and makes the horse much better than its rider at seeing in dim light as well as full daylight. It has a wide range of vision—about 340 of the 360 degrees. Because a horse's eyes are set on either side of its head, it does not normally see objects in depth with binocular vision. It sees them flat, as we do if we shut one eye. And while the horse sees less detail than we do, it is much more sensitive to movement.

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