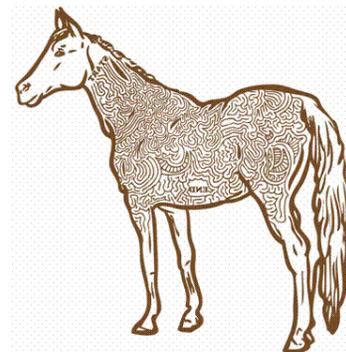




**ALWAYS “FIXED FORMULA”
FOR CONSISTENT
QUALITY, PERFORMANCE AND SAFETY**



**All Grains Are Not Created Equal
Dr. Judith A. Reynolds, Ph.D., P.A.S.**

You love that smell and look of fresh, plump oats, bright yellow corn and sweet smelling molasses in your feed, and so does your horse. But, what is in your feed? And, how will your horse react to what you feed him every day?

Cereal Grains

Cereal grains are the seeds of plants, which contain plant embryos and are high in starch, a readily available energy source for embryos to use until they sprout and begin photosynthesis. Grains are very palatable to horses and have been used as high-energy feeds throughout recent history. We know all grains are not created equal, so let's compare them.

Oats are the traditional cereal grain for horses and are the best choice for several reasons. Oats are very palatable and are the best nutrient-balanced grain, containing about 53% starch, 11% protein, 5% fat and 12% fiber. Most importantly, the starch in oats is easily digested (83%) by enzymes in the foregut. Therefore, oat starch doesn't contribute to starch overload in the hindgut like corn and barley starches do. However, horses fed oats will have increased blood sugar at about 1 - 3 hours after the meal, followed by decreased blood sugar. This effect is similar to that seen in people eating high starch or sugary foods. Some horses are very sensitive to increased blood sugar, and exhibit a 'grain-high' attitude, which can interfere with your training and performance schedule. Also, oats tend to be high-priced for the nutrients they provide. Oats should be clean, but don't need to be processed, except for horses with poor teeth (very young, sick or old horses).

Corn sometimes has a bad reputation, as a horse feed, for good reasons. Corn is more energy dense and heavier than oats, so a direct can-for-can substitution of corn for oats will lead to overfeeding. Also, corn is not balanced for nutrients, containing about 71% starch, 8% protein, 4% fat and only 2% fiber. And, worst of all, most of the starch in corn is not digested in the foregut, unless the corn is ground and pelleted or extruded. Most of the starch (71%) from whole or cracked corn is not digested in the foregut and proceeds to the hindgut where it is rapidly fermented. That process results in the production of lactic acid, which lowers the hindgut pH and kills many beneficial fiber-digesting bacteria. Dying bacteria release toxins, and the result can be a horse with colic and/or laminitis resulting in founder. For these reasons, corn should be processed for all horses, and it should not be more than 20% of a pelleted feed. Also,

corn screenings may contain potentially lethal mycotoxins (fumonisin) and should never be used in horse feeds.

Barley (65% starch) has a hard kernel that horses cannot easily chew, so it is usually rolled. However, even in rolled barley, the starch has a low pre-cecal digestibility (about 21%) in horses. Therefore, oats are a much better choice for horses than barley.

The take-home message here is that oats can be fed whole. However, corn should be processed. Barley isn't helped much even by processing, making it a poor choice for horse feed.

Oats, corn and barley are individual grains. But, what about grain mixes and fortified feeds?

Grain Mixes and Fortified Feeds

Grain mixes contain grains and molasses, but not added vitamins and minerals. They always contain more phosphorus than calcium and usually lead to nutrient deficiencies and imbalances in the total ration. Fortified feeds are very popular, because they contain vitamins and minerals in the correct amounts and ratios for horses. Be sure to check the label. Vitamins and minerals added to feeds must be listed on the label. If they are not listed, the feed is a grain mix, not a fortified feed. Fortified feeds come in two main forms, sweet feeds and pelleted feeds.

Sweet feeds come in all formulas, but they usually contain molasses (4-12%); oats; shelled, cracked or flaked corn (in widely varying amounts) and, hopefully, a pellet containing vitamins, minerals and, possibly, protein. Sweet feeds are the number one choice of horse owners and horses both, but they are detrimental in several ways. The molasses is rapidly turned to sugar in the foregut, contributing to an increase in blood sugar or 'sugar high' that can interfere with performance ability. Also, feeds containing molasses are eaten more quickly by horses, resulting in lower digestibility of the feed. Sweet feeds usually contain a considerable amount of shelled or cracked corn, and many people 'cut' their bagged feeds by adding corn. Most of this unprocessed corn is not digested in the foregut, leading to complications in the hindgut (see Nutrition #1 - The Equine Digestive System). Both of these situations lead to corn starch entering the hindgut, something you definitely want to avoid. Also, sweet feeds have a short shelf life, cake badly in the winter, attract flies in the summer and are expensive for the nutrients they provide. However, small amounts of sweet feeds are good carriers for medications and supplements. And, they might improve the palatability of other feeds.

Pelleted feeds also come in many formulas. When made by a reputable company, they will contain high-quality feeds and by-products from the food industry. Many components of pellets are more digestible due to processing. And, pelleted feeds usually have a longer shelf life, are less messy to handle and are more economical for the nutrients they provide than sweet feeds. Good-quality pelleted feeds are a must for horses with poor teeth. Disadvantages of pelleted feeds are that you cannot see what is in them

in order to determine the kinds of feeds used and the quality of those feeds. This makes it very important to buy from a reputable company.

Whether you use sweet feed or pelleted feed, you should choose feed with at least 10% fiber and, preferably 13% or more fiber. The fiber should be from highly digestible sources such as soybean hulls, beet pulp or alfalfa, not indigestible sources like peanut hulls, straw or rice hulls. Feeds with lower fiber are very high in starch, which is less digestible in the foregut when not eaten with enough fiber, increasing your horse's risk of colic.

We've discussed the relationship between grain-starch and digestive disorders like colic and founder. Other disorders, such as tying-up and gastric ulcers are also associated with grain starches. Several forms of tying-up are the result of horses' inability to use grain starches for energy. Horses with those problems do very well on high forage, fat supplemented rations. Gastric ulcers are more common in horses fed large amounts of grain, because there is not a constant supply of forage to buffer stomach acids, and, because, grain starch can ferment in the stomach, creating additional acid.

CAUTION - Starch from unprocessed corn causes disruption of hindgut environment, which often leads to colic and founder. Don't feed more than minimal amounts of unprocessed corn to horses.

QUICK TIPS

- Pelleted feeds are usually more nutritious and economical than sweet feeds
- Use fortified feeds rather than grain mixes
- Choose feeds with at least 13% crude fiber
- Choose feeds with digestible fibers like soybean hulls, beet pulp and alfalfa
- Limit concentrates to about 3 pounds per meal
- Don't feed more than minimal amounts of unprocessed (shelled or cracked) corn to horses. Better yet, don't feed any unprocessed corn!