



WHY - DIFFERENT FEED TEXTURES?

Considering all the types of feed that are available to you, how do you choose the ideal one for your horse? Should you opt for a textured feed or an extruded feed? Should the textured feed be whole-grain, cracked or flaked? The aim of this article is to make it easier for you to choose by providing you with a better understanding of grain processing techniques and their effect on a horse's well-being.

To facilitate your understanding of the importance of the different grain processing techniques, let's take a look at how the horse's digestive system works. If it had a choice, the horse, like its ancestors, would eat fresh grass for up to 18 hours a day; the horse's digestive tract – stomach, small intestine, large intestine and cecum – being perfectly designed for assimilating this fibre almost continuously. However, this same digestive tract is not very efficient when confronted with a meal that is low in fibre but high in starches (grain), as is sometimes the case for horses with high calorie requirements.

GRAIN PROCESSING AND FEED TEXTURES

Mechanical grain processing principally includes the actions of rolling or cracking the grain, as in rolled oats and cracked corn. These basic types of processing break the outer seed coat, making the starch more accessible for digestion in the small intestine, particularly where corn and barley are concerned. Unfortunately, the simple mechanical processing of barley and corn, even if it improves the pre-cecal digestibility of the starches slightly, is often inadequate when the horse is fed a relatively large volume of the grain at each meal. The situation is different for oats, because it is a softer grain and the starch is more easily digested in the small intestine. In fact, the mechanical processing of oats increases the pre-cecal digestibility of starch by barely 2 to 3%. For this reason, and because it improves the feed's appearance by reducing the presence of the dust, we, at Purina, prefer to use whole oats rather than rolled oats.

THERMAL PROCESSING

Thermal processing, such as grain flaking, goes further than simple mechanical processing. Indeed, the use of steam heat during processing allows the grain to be pre-digested, so to speak. Heat gelatinizes the grain, making it more accessible for pre-cecal absorption. With corn and barley, flaking is a necessity for equine nutrition because it greatly improves digestibility of the starches in the small intestine, compared to whole and even cracked corn or barley. We are talking about 60% improvement in starch digestibility approximately, which is not to be overlooked, especially for horses with a past history of diarrhea, gas and/or gas-colic. While they cost more, feeds that contain flaked, rather than whole or cracked grain, are a wise choice.

PELLETING AND PELLET FEEDS

Pelleting feed ingredients is more complex than heat processing. It implies grinding the ingredients (grain, fibre, fats, vitamins and minerals, etc.) into fine particles, then mixing and compacting the particles, and steam heating them at high temperatures. The resulting mash is then pushed through a pellet die. The action of grinding the grain into fine particles causes gelatinization of the starches and increases the feed's overall digestibility. One of the main advantages of pellets over textured feeds (with grains) is that it makes it impossible for the horse to sort through the feed for preferred ingredients; all of the feed ingredients are in every pellet and every bite of the ration is therefore complete. Also, pelleting allows the conscientious feed manufacturer to use fibre-rich ingredients, which improves the feed's nutritional value.

In addition, pellets are often low-dust, and since their moisture level is low, they are more resistant to mould in hot weather and won't freeze during the long winter months.

Pellet size can vary from one feed to the next. Larger pellet sizes, for example chunks, have the advantage of generally slowing the horse's feed intake. No matter what the pellet size, pelleted feeds can be moistened to make them easier to eat for young horses, senior horses, or horses with dental problems. Integri-T feed should always be served wet because of its high percentage of superior-quality fibre.

EXTRUSION AND EXTRUDED FEEDS

Extrusion is the most recent processing technique for animal feed. It is the technique most often used in dog food manufacturing. Like pelleting, extrusion begins with grinding and mixing the ingredients. The use of steam heat and pressure, in conjunction with extremely high temperatures, allows more extensive gelatinization of the grain starches than with thermal processing and pelleting. The mash that results from these various stages is forced through a machine called an extruder; and more steam and water are added to the mix. A die is used to give the particles their desired shape and when they exit the extruder and are exposed to the air, they literally pop as they expand.

Extrusion is the best process for pre-cecal digestibility of starches. It is therefore especially indicated for horses with digestive problems, such as diarrhea, gas and gas-colic. Research has also shown that because the starches are more readily available to the horse, extruded feeds in general offer superior digestibility. Indeed, cornstarch is said to be three times more digestible in the horse's small intestine if it is extruded; this means that you can feed smaller amounts of extruded feed and still maintain the same performance.

Apart from its exceptional digestibility, the advantages of extruded feed are similar to those of pellets. What's more, because of the size of the particles, extruded feed can slow the horse's feed intake by nearly 50%, thus reducing the risk of colic and choking. In some cases, extrusion, because the ingredients are cooked, leading to denaturing of the protein, is also thought to eliminate certain food allergy symptoms.

Those who worry about vitamin loss as a result of the extrusion process can relax. While this may be true, given that the ingredients are cooked during the process, the conscientious manufacturer makes up for the loss by adding more vitamins.

That being said, the different steps in the extrusion process and the sophisticated equipment that is required means higher manufacturing costs than for textured or pelleted feeds. However, for many, the higher price is amply justified by the knowledge of a lower risk of starch overload in the large intestine, and by the fact that smaller amounts are used.

TEXTURED FEEDS (SWEET FEED)

Textured feed, often called sweet feed, was the first horse feed commercially available on the market. At one time – and still today occasionally – sweet feed referred to a simple mix of oats, corn and molasses, a nutritionally incomplete product due to the vitamin and mineral deficiencies of these grains. These days, in addition to grain and molasses, textured feeds generally include a pellet containing vitamins and minerals (pre-mixes). Various other ingredients may be added depending on the type of horse it is intended to feed, among others, fat and yeast.

A quality textured feed should, at the very least, contain heat-processed grains (flaked barley and/or corn, extruded corn), round oats to avoid the dust of rolled oats, a controlled starch level, as well as a significant percentage of digestible fibre and fat. Don't hesitate to ask your feed supplier about these different elements which say a lot about product quality. And remember, textured feeds, even though they all look alike at first glance, are not all created equal! One must look beyond the percentage of protein...

The main advantage of textured sweet feed is the palatability conferred by the molasses in the product; some finicky horses, especially horses stressed by the demands of high performance, will in fact only eat sweet feed. However, because of its high moisture content, it can easily go mouldy in hot weather, and will freeze quickly when the temperature drops below zero.

MULTI-PARTICLE FEEDS

Multi-particle feeds, generally pelleted, also contain extruded particles. They therefore offer the advantages of both pelleting and extrusion. In this regard, Purina offers the Evolution line, complete feeds that nourish the horse through every stage of life: Maternity, Juvenile, Sport Elite and Senior. Trimax is a multi-particle feed designed for performance horses. In addition to being high in fibre and fat, with a controlled starch level, all of these multi-particle feeds contain added yeast culture, prebiotics, probiotics, Omega 3 and B Vitamins, and feature extruded particles that improve the feed's overall calorie and vegetable fat content. For these reasons, these feeds remain very effective, as well very safe for the digestive health of the horse. Like extruded feeds, multi-particle feeds are high-end products and therefore cost more.

AND GRAIN SERVED AS IS?

Grains are good **ingredients** for a commercial complete feed, but the same grains, served "as is" to a horse, will not provide adequate nutrition because they are incomplete.

Take the case of oats, which in spite of affording satisfactory digestibility for the small intestine – as long as the horse has good teeth – remain low in protein and calcium. The amount of vitamins they supply is also negligible. The small percentage of calcium in oats leads to an imbalance in the calcium-phosphorus ratio which is contraindicated for the horse. What's more, the energy source available to the horse from oats is starch, known frequently to cause excitability problems in some horses. Plus the amount of fat, an extremely digestible calorie source with numerous benefits, is also negligible in oats and other grains.

In addition, serving a horse oats, or any other grain, without first having it analyzed for its nutritional quality could affect the nutritional balance of the ration. As well, not testing grains to determine the level of toxins they may contain remains very risky indeed. Depending on growing and harvesting conditions, overly high toxicity levels in grain can lead to health problems in the animal. Reputable feed manufacturers test the grain they use as their base product and if the grain does not meet pre-established quality standards, it is very simply rejected. This knowledge alone provides priceless peace of mind...

When the time comes to purchase your next bag of feed, remember that, texture aside, if the feed does not look very appetizing to you, and you have doubts about the quality of its basic ingredients, it is better not to serve it to your horses. Buy only good-quality products from reputable suppliers.

THE STARCH DIGESTION SITE

Starch, the main component of grain, is digested in the horse's small intestine but only a small quantity can be absorbed at one time. The starch that is not digested by the enzymes of the small intestine will travel to the horse's large intestine, which can unfortunately lead to a host of health problems; indeed, the large intestine, or colon, is designed for the fermentation of fibre, not starch. When there is an overload of starch in the large intestine, digestive problems can be expected, leading potentially to gas accumulation, hindgut acidosis, diarrhea, lactic acid accumulation, gas-colic and laminitis.

It is precisely to minimize the risk of such digestive problems that the different grain processing techniques should be considered when selecting a feed.