

HAVE YOU TRIED POULIN GRAIN'S PERFORMANCE ENDURE 10:8 AND 10:12?

Endure 10:8 and 10:12 are Poulin Grain's high fat, low carbohydrate feeds. They are formulated to provide long-term sustainable energy to competitive performance horses. These feeds include beet pulp, a highly digestible fiber source, which ensures a safe, low sugar form of energy and helps horses maintain proper fluid balance in the digestive system. Endure 10:8 and 10:12 are designed with high levels of vegetable fat. Fat helps performance horses maintain calorie intake and body condition without the fluctuations in blood sugar common with feeding large amounts of grain. Finally, Endure 10:8 and 10:12 are enriched with high levels of selenium and vitamin E. These two nutrients are powerful anti-oxidants necessary to maintain muscle health and protect immune system function. Endure 10:8 and 10:12 are the feeds of choice for performance horses in active work, and for horses that need to gain weight.



Contact your nearest Poulin Grain Dealer for more information or contact Poulin Grain's Customer Service @ 800-334-6731.

Poulin Grain, Inc.

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CARBOHYDRATES 101: UNDERSTANDING THEIR ROLE IN EQUINE NUTRITION

The statement, "I want a low carbohydrate feed for my horse", has become popular in recent years. The reasons, or potential reasons, for wanting a low carbohydrate horse feed could include the desire to influence or modify behavior, or a sensitivity to so-called carbohydrate diseases including: Tying-up, Cushing's, Laminitis or Osteochondritis dissecans (OCD). But before we try to eliminate all the carbohydrate, we should understand more about the carbohydrates in horse diets.

Carbohydrates found in horse diets can be roughly divided into two types: Structural and Non-structural. Structural carbohydrates are often referred to as fiber. Fibrous carbohydrates are resistant to enzyme digestion in the small intestine and must be fermented by bacteria in the horse's large intestine. Bacterial fermentation of fiber yields volatile fatty acids (VFA's). VFA's travel to the liver and are converted to energy substrates for the horse. Hay, mature pasture grass, beet pulp and soybean seed coats are good sources of fibrous carbohydrate.

On the other hand, non-structural carbohydrates are sugars, or carbohydrates that can be broken down to simple sugars, by enzymes in the horse's small intestine. These sugars are absorbed from the small intestine and circulate in the blood as glucose. The hormone insulin removes glucose from the blood and stores it in the liver and muscle as glycogen, or when an excess amount of carbohydrate is consumed, it is converted to fat and stored throughout the body. Common examples of non-structural carbohydrates in horse diets include starch from grain (oats, corn, barley, etc) and molasses.

Behavioral changes and several so-called carbohydrate diseases are thought to be associated with the non-structural carbohydrates (sugars) and not with structural

CONGRATULATIONS TO KATHY BRUNJES AND ALI DARKNESS ON THEIR ENDURANCE RACE!

Ali Darkness, 12 year-old Arabian gelding owned by Kathy Brunjes of Bethel, Maine, was selected, along with five other horse/rider teams, to represent the United States Endurance community at the World Equestrian Games, held in Jerez, Spain during the weeks of September 9-22, 2002. During the rigorous selection trials, where 45 horse/rider teams were evaluated, Ali and Kathy traveled to North Carolina and Kansas to demonstrate their endurance ability, competing in 100-mile endurance races. This earned them a spot on the six-member U.S. Endurance squad, and later on the four-member U.S. Endurance Team, competing against 35 Teams from all over the World on September 16. The U.S. Team finished in fifth place.



*Kathy Brunjes and Ali
Darkness of Bethel,
Maine*

During Ali's extensive training and competition schedule, he was fed Poulin Grain's [Endure 10:12](#). Feeding Endure 10:12 enabled Ali to maintain body condition without making him hyperactive before, during or after competition. Endure's high fat and high fiber formula provided Ali with plenty of energy, but did not provide the excessive carbohydrate thought to be involved in muscle disorders such as tying-up.

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(fiber) carbohydrates in the diet. For example, excitability or nervousness in horses is often thought to be associated with feeding grain. The theory is that an increase in blood sugar from the digestion of the starch in grain and the absorption of glucose results in hyperactive behavior. If grain is truly a cause of hyperactivity, it should be possible to control this behavior with diets low in non-structural carbohydrate and high in fat and fiber. However, many horse owners believe that behavior is an individual horse characteristic that can only be modified with training and is independent of diet. More research is needed in this area.

Cushing's disease is a problem showing up in many horses, primarily old horses, which may be influenced by the non-structural carbohydrate content of the diet. Cushing's disease is the result of a tumor in the pituitary gland. Two recognized complications of Cushing's are laminitis and diabetes mellitus. Laminitis and diabetes mellitus both appear to be the result of insulin resistance. Since insulin is required to clear the blood of high amounts of glucose following a meal, diets high in non-structural carbohydrate (sugar) may make diabetes mellitus worse and increase the risk of laminitis in horses with Cushing's. Therefore, it is common for veterinarians and nutritionists to reduce the amount of non-structural carbohydrate in the diets for horses with Cushing's.

Tying-up, characterized as severe muscle pain and cramping after exercise, is also thought to have a link to dietary carbohydrate. For horses that have chronic episodes of tying-up, two separate problems have been identified. One problem is a muscle sugar (glycogen) storage disorder characterized by accumulation of a non-bioavailable sugar in their muscle. This disorder is called polysaccharide storage myopathy (PSSM) or equine polysaccharide myopathy (EPSM). For still other horses that chronically tie-up, a problem with muscle contractility is to blame. This problem is called recurrent exertional rhabdomyolysis (RER). For both groups of horses, dietary modifications that include a reduction in non-structural carbohydrate and increases in fat and fiber have shown to be beneficial in minimizing the occurrence of tying-up.

Research is ongoing as to a possible link between dietary carbohydrate and the incidence of a growth

problem known as osteochondritis dissecans (OCD). Preliminary studies have focused on potential insulin insensitivity coupled with high insulin production following a meal rich in non-structural carbohydrate (grain). It appears that insulin may interfere with the normal maturation of cartilage into bone. Feeds that are low in non-structural carbohydrate are now being tested in the rearing process for young, growing horses.

From the available information on behavior modification and the several diseases thought to be sensitive to carbohydrate in the diet, the desire to create a low carbohydrate diet is really a method to control the amount of non-structural carbohydrate (sugar) in the horse's diet. Structural carbohydrate (fiber) should not be the target for elimination since fiber is essential for proper function and motility of the horse's digestive system. It is still recommended that horses receive a minimum of 1.5% of their body weight per day in dry forage to provide essential fiber. The first step in minimizing the amount of sugar in your horse's diet is to determine the non-structural carbohydrate content of your feed. Unfortunately, this is not information that can be found on the feed tag. Table 1 lists the non-structural carbohydrate content of feeds common to this area. The second step in minimizing the amount of non-structural carbohydrate is to only feed the amount of grain or supplement necessary to maintain body condition and ensure proper dietary fortification of protein, vitamins and minerals. If horses do require large amounts of

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Product	Non-structural carbohydrate (NSC), %
"Low NSC"	
Grass Hay	20.3
Alfalfa Hay - High Quality	31.5
Poulin Stable Mate 14% Complete	16.3
Poulin MVP	17.4
Poulin Equi-Pro Senior	31.3
Poulin Endure 10:12	33.7
Poulin Endure 10:8	33.9
"Moderate NSC"	
Poulin Equi-Pro Growth	40.4
Poulin Equi-Pro Development	40.7
Poulin Equi-Pro Perform	41.1
"High NSC"	
Oats	57.7
Barley	62.8
Corn	73.7

*Non-structural carbohydrate levels in Poulin Grain Feeds were determined by an independent laboratory.

RESEARCH UPDATE: IMMUNE FUNCTION

Immune function and methods to boost immune response have been studied in livestock for many years. With the extensive travel schedule of equine athletes and the presence of new disease threats such as West Nile Virus, proper immune function is paramount. Several nutrients have been identified as capable of a stimulatory influence on immune function, most notably antioxidant vitamins and minerals. Two recent experiments have each reported nutrition to stimulate immune function in horses. The first, an experiment conducted by Performance Horse Nutrition and Washington State University, with recently captured Bureau of Land Management wild horses, reported that feeding a diet fortified with vitamin A, vitamin E and trace minerals significantly stimulated immune response to routine vaccinations. The second study conducted by Colorado State University, in which young, growing horses were fed more bioavailable, chelated trace minerals reported improved humoral immune response to a foreign antigen test compared to horses being fed the same amount of traditional, non-chelated trace minerals. Both of these studies, highlight diet quality as an important stimulant to immune function. Equine diets formulated by Performance Horse Nutrition include chelated trace minerals from Alltech (Bioplex) and high levels of antioxidant vitamins to maximize immune function.

DO YOU HAVE A QUESTION ON EQUINE NUTRITION?

Ask your question here and mail it to:

Poulin Grain, Inc.
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QUESTION AND ANSWER WITH DR. STEPHEN DUREN

How much fat can be fed to a horse per day?

Horses can efficiently digest large amounts of fat in their diets. Research has shown that horses can consume as much as 20% of their total caloric intake as fat. In practical situations, most high-fat diets supply less than two cups of vegetable oil per day. Feeding more than two cups of vegetable oil daily is often not efficient because the horse may refuse to eat a meal top-dressed with that much fat. The addition of fat to the diet should be started slowly so horses can adjust to the dietary change. A good starting point is one-quarter cup of vegetable oil per day divided equally in at least two feedings. If more fat is required, slowly increase the amount of fat over several weeks.

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grain, try to feed products with moderate to low levels of non-structural carbohydrate. Finally, the use of dietary fat, either in the feed or top-dressed onto the feed, has been shown to slow the rate at which the stomach empties and to control the surge of blood glucose following a meal. Therefore, feeding high fat feeds or adding fat to the diet seems to eliminate many carbohydrate problems.