

## Feeding Draft Horses: The EPSM Diet

A diet low in starch and high in fat is beneficial for draft horses & ponies.

Story and Photos by Beth A. Valentine, DVM, PhD.

Draft horses and draft-light horse crosses have been around for a very long time. In years gone by, these powerful and hard working horses worked to build our cities and to produce, harvest, and transport the food we eat and the supplies we need. Although the age of the machine is upon us, working horses are definitely still with us. Folks, who prefer working the forest or fields with horses, rather than with machines, can be found in virtually every country in the world. But the popularity of the draft breeds has moved far beyond the field and forest. People are discovering that drafts are incredibly versatile animals, with the ability to be super trail horses and to excel as performance horses in many different disciplines. Many times the first draft horse becomes only one of several in the barn. As I like to say, "you gotta love a draft!"

Years ago no one asked many questions about what is the best diet for draft horses. Drafts, like most horses, were fed a traditional diet of grain and hay. Aside from water, forage, whether in the form of hay or pasture, is always the most important part of any horse's diet. Remember that most horses should be fed 2 - 2.5 percent of their body weight in forage per day, so a 2000 pound draft can eat a lot of hay! But is hay or pasture enough, and is grain the best option for needed extra calories?

Studies in the last ten years have taught us an enormous amount about the nutritional needs of draft related (and many other) horses. In particular, the focus has been on what to feed to keep a horse's muscles healthy. After all, muscle is the reason we have horses, especially draft horses. There is still a lot to learn, but what we have found is that many drafts are "metabolically different" than we expected, and that a traditional diet of forage, or forage with supplemental grain is often not enough to keep draft horse muscles healthy. Draft and draft related horses that are not fed properly are at risk for developing a muscle problem known as equine polysaccharide storage myopathy (EPSM, also called PSSM and EPSSM), which is a fancy way of saying that the muscle builds up glycogen and glycogen related compounds rather than using them for energy. And drafts are often stoic and don't show signs of the problem until it is quite severe. Mild indications of EPSM include poor hind muscling, stiff hind limb gait, abnormal muscle cramps leading to what is called "shivers," poor performance, and a low energy level. Some people think that drafts are low energy by nature, but nothing could be further from the truth - try spending some time at a draft horse pulling competition

and you'll see! Older drafts that develop a stiff hind limb gait are often misdiagnosed as having "arthritis." An older draft that is reluctant to canter may be considered "normal." So, subtle signs of EPSM are often overlooked or misdiagnosed.

Severe problems related to EPSM include tying up (also called Monday morning disease and azoturia), progressive muscle wasting, and weakness leading to an inability to stand after lying down. In fact, EPSM is a common reason why so many wasted drafts are found at auctions, and many people have assumed the problem was neglect or abuse. Owners who have "rescued" such drafts find that simply feeding these horses a traditional diet cannot solve the problem.

It was discovered about 10 years ago that draft muscles are prone to building up abnormal levels of glycogen. To prevent this condition, we designed diets that relied on fat and fiber calories rather than starch and sugar calories. The grains in the diet were drastically reduced, and fat calories were added to provide needed energy. Along with plenty of good quality forage, supplemental vitamin E, and when needed, supplemental selenium, this diet has been a life saver for many draft related horses. Often referred to as the EPSM diet, this type of feeding not only treats affected horses, but we believe it can help prevent this problem from ever occurring. Draft related foals can be weaned onto a high-fat, high-fiber, and low starch and sugar diet, along with supplemental vitamins and minerals to help support healthy growth. Working drafts have better muscling and more endurance on this type of diet. And older drafts benefit from the high density calories of fat. Fat provides calories that don't need to be chewed, and reduces the risk of laminitis due to age-related pituitary gland problems. So, the EPSM diet works for drafts of all ages.

How much fat are we talking here?

This Percheron gelding exhibits one of the subtle signs of EPSM. Notice that his coat is shiny so you know he is not being neglected, but his hind end muscling is underdeveloped when compared to the front.

Technically we are aiming to provide at least 20-25 percent of total daily calories from fat and less than 15 percent of total daily calories from starch and sugar. I should add that this would be considered a low fat diet for people. Horses digest added fat very well, and do not metabolize fat into the low density lipoproteins (LDLs) that contribute to disease in people.

The easiest way to design an EPSM diet is to gradually decrease starch and sugar intake and gradually introduce fat into the diet. Increase the fat until the horse is getting at least 1 pound of fat per 1000 pounds of horse per day. Fat can be provided in the form of plant origin oil (such as soy oil, rice bran oil, corn oil, flaxseed oil, etc.). Two cups of oil is 1 pound of fat. Feeds that are at least 10% fat and also low in starch and sugar can also

provide some of the needed fat. You can calculate the amount of fat in these feeds by multiplying pounds fed per day by the percentage of fat in the feed. That is, 1 pound of a 10% fat feed provides  $1 \times 0.10 = 0.10$  pound of fat.

There are different types of fatty acids in different fat sources, but at this point we have no indication that any type of fat is any better than another when it comes to feeding drafts. Whatever type of fat you are happy buying, that your horse is happy eating, is the best fat. My only caution is that the entire fat needs should not be provided by linseed (flax) oil, as at high levels (about twice the EPSM "dose") this oil can cause gastrointestinal irritation.

Many people find that this type of diet can improve even normal appearing drafts, by providing safe calories that reduce the risk of colic, laminitis, and possibly stomach ulcers, and by reducing excess body heat production during exercise in hot, humid weather. The latter is particularly important, as the skin surface area to muscle mass ratio in drafts is much smaller than in light horse breeds, and excess body heat can be a real problem for heavily muscled horses.

#### Before an EPSM Diet

This Belgian mare was rescued from slaughter. Her severe muscle wasting is indicative of EPSM.

What about protein?

Many people focus on the protein level of concentrated feeds. Some know that about 10% protein is all an adult horse that isn't working hard or being bred needs, and steer clear of higher protein feeds. What many people don't realize is that the recommendation for protein is for the horse's entire daily diet, most of which is hay or pasture. Horses that are eating forage that is less than 10% protein will need a higher protein concentrate. This will be particularly important for young growing horses, for broodmares, and for hard working horses. Without analysis it is impossible to know the protein content of the forage, although in general clover and alfalfa products are higher in protein than grass. No one yet knows whether drafts need more protein in their diet than light horses, but since they have more muscle to maintain I'd rather err on the side of a bit more protein than the horse might actually need.

Is too much protein bad for a horse?

There are many claims that excess protein causes liver and kidney problems, or causes horses to be overly energized. Actually, the only problems associated with feeding too much protein are increased urine production that is higher in ammonia, and increased body heat production

during exercise. High ammonia levels can be irritating to the respiratory tract, especially of foals that are closer to urine-soaked bedding. Increased heat production can be a problem for drafts exercising in hot, humid weather. Feeding a fat supplemented moderate protein diet will help to keep the horse cooler, especially in hot and humid weather. Addition of electrolytes when the horse is working hard and sweating a lot will be important to replace salts lost in sweat. And, be sure to cool the horse with cold water and provide plenty of water to drink after exercise. Studies have disproven the ideas that cooling a horse rapidly and that letting a hot horse drink water will cause problems with colic, laminitis, or tying up. In fact, not cooling a horse and rehydrating it rapidly can cause health problems.

#### After Feeding an EPSM Diet

It takes time (just over a year in this case), but feeding an EPSM diet can really make a difference.

So what is the bottom line when it comes to keeping drafts healthy?

My best recommendations are: plenty of good quality forage, a low starch and sugar and high-fat diet, plenty of vitamin E and adequate selenium, access to plenty of clean water and free choice salt, fresh air and exercise, and heaps of love and attention. Try it, I think you'll like it! Dr. Valentine is an Associate Professor at the College of Veterinary Medicine at Oregon State University. Dr. Valentine owns drafts with EPSM, and helps keep them healthy with diet and exercise. She is the co-author of "Draft Horses, An Owner's Manual" published by Rural Heritage [www.ruralheritage.com](http://www.ruralheritage.com)

#### Examples of EPSM Diets

by Jill Haight

Seminole Feed has several low-starch and high-fat feeds that fit perfectly into an EPSM feeding program. Perfect 10, Perfect 12 and Victory! are both high in fat and low in starch. Seminole Senior and Spillers Hdf Pellets provide very low starch levels and may be supplemented with Seminole Ultra Bloom, Seminole Rice Bran Oil or Seminole Corn Oil to increase the amount of fat in the diet. The following are examples of diets that provide the recommended levels of fat for working horses with EPSM when fed with recommended amounts of forage:

2000# Draft horse on Seminole Perfect 10 & Seminole Rice Bran Oil  
10 pounds per day of Perfect 10 = 1# fat  
2 cups of Seminole Rice Bran Oil = 1# fat  
Total fat in diet is 2.0 pounds.

800# draft horse on Seminole Perfect 12 & Ultra Bloom

10 pounds per day of Perfect 12 = 1.2 # fat

3 pounds per day of Ultra Bloom = .6 # fat

Total fat in diet is 1.8 Pounds.

600# Draft horse on Seminole Victory! & Seminole Corn Oil

8 pounds of Seminole Victory! = .64 # fat

2 cups of Seminole Corn Oil = 1 # fat

Total fat in diet is 1.6 pounds

1300# Draft/Light Cross on Seminole Senior

8 pounds of Seminole Senior = .56# fat

$\frac{3}{4}$  Cup of Seminole Rice Bran Oil = .75# fat

Total fat in diet 1.3 pounds

1000# Draft Pony on Spillers HDF Pellet & Seminole Rice Bran Oil

6 pounds of Hdf Pellets per day = .3# fat

1.5 cups of Seminole Rice Bran Oil = .75# fat

Total fat in diet = 1 pound

To learn more about these Seminole Feed products visit [www.seminolefeed.com](http://www.seminolefeed.com).