EQUINE FAQ

What about . . . EPSM?

Originally thought of as a draft horse disease, EPSM or ***Equine Polysaccharide Storage Myopathy*** has since been discovered in numerous breeds including warm-bloods, light horses (TB's, Arabians, Standardbreds, Quarter Horses, etc.), Norwegian Fjords and even some draft mules. It is essentially an inability to convert carbohydrates/grains into *glycogen* and then into *glucose* for muscle fuel.

EPSM treatment in the past has consisted of euthanasia but, with early diagnosis, many horses can live long and useful lives with only dietary changes.

Symptoms

Some EPSM symptoms include:

- Lack or loss of muscle mass or conditioning, especially in the shoulder or hind quarters
- Laboring or tripping
- "Stringhalt", "shivers", or fibrotic myopathy-type gait, especially when backing or turning (may look like a "locking stifle")
- Trembling, especially after exercise
- "Tying up" or Monday Morning Disease (*exertional myopathy*)
- Difficulty rising, backing, or reluctance to back
- Lack of energy, stumbling
- Poor performance
- Reluctance to pick up feet for shoeing, etc.
- Lifting or "stomping" of hind limb or limbs, especially while standing
- Episodes of "colic", especially after exercise
- Slightly stiff, awkward, or short strided hind limb gait often have no "hock action" ("pony-gaited")
- Sore back/assuming an extended "rocking horse" or urination-type posture
- Recumbency with inability to rise
- Increased temperature (hyperthermia) during recovery from anesthesia.
- Jerkily "snapping" legs higher than necessary when asked for just a few inches of foot rise

Diagnosis

Because of the variety of symptoms, many affected horses have been misdiagnosed as having foaling complications, colic, other diseases including Equine Motor Neuron Disease (EMND), Lyme Disease, Arthritis/Joint Problems, Anemia, or, in non-severe cases, a "poor mover," a horse with behavioral problems, or even just sheer laziness. Although EPSM may result in slightly abnormal blood levels of muscle enzymes, affected horses may also have normal readings making this test inconclusive. According to researcher Beth A. Valentine, DVM, PhD, Neuromuscular Disease Laboratory, Cornell University, the only sure diagnostic test is a muscle biopsy.

Dr. Valentine prefers to biopsy the hamstrings, suggesting taking the sample high up, just below the base of the tail, and close to the midline of the rump. This area generally heals with no suture-pulling, is safe from mud with a rolling horse and tail hairs will cover the resulting small scar. She considers the best biopsy procedure for EPSM diagnosis to be an *incisional biopsy* consisting of obtaining a 1" to 1.5" long vertical sample about the diameter of a pencil. This allows several different sections to be taken thus avoiding sample error. After suturing, the horse should be turned out immediately rather than forced stall rest which can further debilitate muscles.

Treatment

Horses with EPSM cannot derive adequate muscle energy from standard grain/sweet feed and so should be switched from a high carbohydrate diet to a high fat one. ***This appears to be close to 100% effective if begun in the earlier stages of the disease.*** The goal is to provide 20% to 25% of total daily calories from fat derived from vegetable oil, powdered animal fat, or commercial feeds designed to be high in fat. *The Cornell study also indicates that this diet can be used as a diagnostic trial for a horse exhibiting some typical EPSM symptoms.*

The horse's muscle is gradually "trained" to use more fat for energy than it normally would, thus decreasing its reliance on *glycogen*. Dr. Valentine considers that an optimum amount of fat to head for per 1000 pounds of equine body weight is one pound dry fat or 2 cups oil fat. She suggests replacing the grain ration with an equal amount by weight of alfalfa pellets which provide added protein required for energy and muscle rebuilding. She goes on to explain that horses with EPSM appear able to take in a tremendous amount of dietary fat without gaining weight. Once the EPSM has stabilized, however, if the same amount of fat results in increased weight, decrease the amount of daily calories while keeping fat levels as high as possible and encouraging more exercise. Other nutrients found necessary include Vitamin E, Selenium, and a broad-spectrum vitamin/mineral supplement.

Dr. Valentine further explains that it can take 2-6 months to fully integrate the new diet. However if no increased energy, increased muscle mass or general surcease of symptoms is seen in that time, then your horse is

apparently beyond dietary help. Occasional episodes of "tying up" during that period, however, can simply indicate a part of the healing process rather than a continuance or exacerbation of the disease itself.

Also, she says some owners have reported their horses "bouncing off the walls" after the diet change. Since higher fat diets have a calming effect in normal horses, a horse exhibiting such behavior after the diet change, Valentine claims, is "one that really needs it;" the horse suddenly has the energy it has been missing and is simply feeling good. She suggests giving all EPSM horses plenty of turnout and regular exercise. If your horse responds favorably, ***diet therapy must be maintained for the rest of the horse's life.***

AN HOLISTIC APPROACH

Dr. Valentine says, when asked about the advisability of breeding EPSM horses, that *"At this point it appears that about two-thirds of all draft related horses and about one-third of light horse breeds have the type of metabolism that predisposes to EPSM. They are often the best built, best temperament, and best performing horses, which makes me wonder if we have somehow selected for this type of metabolism. If so, its about time we figured out how to feed them right."*

We most emphatically agree that we need to learn how to "feed them right," but ***all*** horses regardless of EPSM status! For animals that evolved over tens, if not hundreds, of thousands of years as grass eating herbivores, to suddenly pour concentrated carbohydrates such as grain and sweet feeds (20-25# per day is not unheard of for competitive stock) into them seems foolish at best and utterly destructive at worst. For just one reason alone, horses lack *amylase*, the pancreatic enzyme necessary for starch digestion [EQUINE BASICS: GRAIN] so heavy grain feeding is bound to cause problems.

Although we obviously agree wholeheartedly with Dr. Valentine's halting all grain feeding (although some EPSM horses do well with a cup or so of **PGR**), we do suggest options for some of her other directives.

"fat derived from vegetable oil, powdered animal fat, or commercial feeds"

The fact is that horses also lack a gall bladder, the organ that helps assimilate fats; thus they are obviously not designed to be heavy fat eaters. Fractionated oils (separated from their original seed source) are absorbed through the *lacteal ducts* in equine intestinal tracts. Since these ducts are also the receptor sites for the fat soluble vitamins A, D, E and K, the oil competes with, and inhibits the absorption of, these key vitamins that relate to calcium assimilation, antioxidant function and blood clotting ability. No wonder Dr. Valentine suggests giving a broad-spectrum supplement! Also, almost all oils (and certainly both corn and canola which are the typical "horse" oils) are high in Omega 6 making them prone to producing inflammatory prostaglandins thus contributing to both structural deficiency and future joint problems when fed for more than a few weeks. If that is not enough to discourage oil use, according to Dr. Eleanor Kellon (Horse Journal, Nov. 1998), corn oil (and coconut oil) inhibits magnesium (vital for muscle/nerve function) absorption.

As for the suggestion of animal fat sources for an herbivore, that simply makes no sense whatsoever especially when one considers the link of BSE (mad cow disease) in the cattle industry associated with that very bizarre directive which flagrantly ignores the herbivore digestive process.

We also question the use of commercial feeds because of the vast quantities of toxic chemicals contained therein. Such chemicals can seriously affect the ability of the liver, essential in the starch digestive process, to function appropriately in both its *bile* production and its ability to act as a *glycogen* storehouse. If the liver cannot function appropriately due to toxicity or congestion, the *glycogen* will be unavailable during periods of exercise causing a horse to simply run out of steam, be unable to move forward or to become shaky and anxious—all EPMS symptoms.

Option: Our suggestion for a safe and digestible high fat feed source is **H.E.S.** (High Energy Supplement) pellets made from extruded whole soybeans which provide a living (meaning high enzyme value) source of quality digestible fat while also providing an excellent protein source. At 8% fat and 30% protein, and with suggested feeding amounts ranging from ½-1½ pounds per day, it provides necessary levels of both fat and protein in a viable, cost-effective, natural, enzyme-rich, bioavailable form while also acting as a source of the B-vitamin *choline* necessary for neuromuscular health.

Additionally: Other causes of liver toxicity can be the ingestion of chemical wormers, vaccines, "dead feed" (lacking vital enzymes) and pollution of all sorts. In order to keep the liver clean and functioning properly, we suggest avoiding known toxins as much as possible and detoxing daily or quarterly with **Excel**.

"replacing the grain ration with an equal amount by weight of alfalfa pellets "

Besides containing an overabundance of calcium, another magnesium suppressor, alfalfa feeding can cause numerous side-effects not the least of which are an inability to perform optimally and a tendency toward colic; two more symptoms associated with EPSM [EQUINE BASICS: FORAGE & HAY]. Also, alfalfa (or any legume) contains *trypsin* inhibitors which suppress the normal production of pancreatic *trypsin* and which can cause pancreatic enlargement thus further inhibiting proper digestion.

Option: **H.E.S.** pellets

Additionally: Always make sure all horses have 24/7 quality grass hay (NO leguminous hay including clover or grain hays such as oat hay) availability. For horses with EPSM, consider timothy hay which contains

the least amount of carbohydrates.

"Vitamin E, Selenium and a broad-spectrum vitamin/mineral supplement"

While both Vit E and Selenium are vital for health, the chemical form of Vit E (dl-alpha tocopherol vs. the natural d-alpha tocopherol) is unavailable to the body thereby contributing to liver toxicity while an overabundance of selenium can cause a fatal full body toxicity.

Option: Generally speaking, **Dynamite Regular** formula pellets provide not only the suggested broad spectrum supplement, but also sufficient amounts of both Vit E and Selenium for almost all horses, including EPSM ones, except perhaps in selenium deficient areas. If, after a horse has been on the **Dynamite Regular** for a while, a blood test indicates the need for extra Selenium then **E-Selenium** can be added to the diet according to directions and only under veterinary supervision.

Additionally: With a challenge such as EPSM, it is also necessary to look at optimum *neuromuscular transmission* which enables nerves, and therefore muscles, to function properly.

Choline, a part of the entire B-complex, is necessary for the production of *acetyl-choline*, which in turn is necessary for not only nerve firing but also for fat metabolism. **Dynamite Regular** contains 4300 mg of *choline* per pound although it is fed at only 1-2 oz/day depending on work or healing load.

Magnesium is necessary for the liver to convert *glycogen* into *glucose*, it relaxes muscles, feeds nerves and is essential in the ATP energy cycle. Stress (whether hauling, training, or being with the wrong companions) can also deplete magnesium stores in horses while crop stress, such as drought, can create imbalances in the feed. In fact, cattle on drought ranges can exhibit *grass tetany* which is essentially magnesium deficiency.

To ensure the full range of vitamins, feed **Dynamite Regular**. To ensure the full range of minerals, allow your horse to balance/regulate itself from the free choice offerings of **Izmine** (relatively high in magnesium), **1 to 1**, **2 to 1**, and **NTM Salt**. *(By the way, this unbleached salt provides appropriate levels of available sodium chloride which the body requires for hydrochloric acid production in turn vital for digestion within the stomach; standard bleached salt is lacking in complementary trace minerals [EQUINE BASICS: SALT].)*

"bouncing off the walls"

This behavior speaks to us of not just increased energy, but also perhaps of a nutrient imbalance and even inadequate quarters [EQUINE BASICS: LODGING].

Option: Horses requiring more "nerve" nutrients than offered by the basic program, frequently show a profound change with the addition of **Easy Boy**, an excellent source of both magnesium and B-vitamins.

Additionally: If a horse is not digesting properly it cannot possibly be obtaining necessary nutrients nor will unhealthy intestinal bacterial colonies be able to provide the various and necessary B-vitamins which is a part of their job description. Another part of their job description includes the production of *volatile fatty acids* (*acetic, propionic, butyric*) which supply much of a horse's energy requirement.

For assurance of healthy intestinal colonies, daily **DynaPro** is essential for all horses having health challenges [EQUINE BASICS: PROBIOTICS]. Unfortunately, these colonies can be seriously diminished by such stressors as drugs (wormers [EQUINE BASICS: PARASITES], vaccines [EQUINE BASICS: VACCINES], antibiotics and Bute), housing [EQUINE BASICS: LODGING], training [EQUINE BASICS: TRAINING], hauling [EQUINE FAQ: HAULING], and more.

Also, since the mouth is the first stage of the digestive process, do make sure your horse receives a thorough exam (not just "floating") from a qualified equine dentist [EQUINE BASIC: TEETH].

"muscle biopsy"

If a biopsy for diagnostic purposes has been performed on your horse, we suggest treating it as any similar wound with **Release** spray as frequently as you want or can, **Wound Salve** until healing has occurred and then **Wound Balm** (following suture removal) to help prevent scarring or white hair growth [EQUINE FAQ: WOUND CARE].

Our conclusion

It appears to us that, along with so many modern diseases, EPSM can be linked to modern horse management practices which ignore basic equine physiological (and psychological/emotional) needs. Interestingly, Dr. Valentine states *"It may be that changing the diet of draft horses from a carbohydrate-based concentrate to a high fat, low carbohydrate feed may decrease, delay, or even prevent the signs of EPSM in affected horses. Even horses not on grain are at risk of developing signs of the disease, as they are still not able to derive enough energy from forage."* . . . . . and not just draft horses!

Once again, the basic ***DYNAMITE®*** program consisting of free choice high quality grass hay, all four free choice mineral powders (**Izmine**, **1 to 1**, **2 to 1**, and **NTM Salt**) to supply those missing in forage and hay, minimal grain (**PGR**) or none at all, daily **DynaPro** as an intestinal/digestive aid, supplementation with **Regular** pellets and perhaps some **Easy Boy** (or **TNT** 6-in-1 pellet), and quarterly detoxing with **Excel** are frequently all that are necessary even for EPSM. Of course, avoiding over-worming and over-vaccination (this according to the AVMA itself!) are also of vital importance.

NUMEROUS ***DYNAMITE®*** DISTRIBUTORS and users alike with EPSM horses have found success by following this common-sense approach; perhaps you can also. ■