



# Equine News



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**Medical conditions that are becoming more and more frequently diagnosed in our horses: Equine Metabolic Syndrome, Pituitary pars intermedia dysfunction, Insulin Resistance, Endocrinopathic Laminitis**

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If colic and founder aren't enough to try to grasp and manage, horse owners are now bombarded with many complicated, sometimes mysterious, and for sure hard to pronounce medical conditions. Our recently held OSU Horse Owner's Symposium had several presentations on these subjects, as OSU Veterinary Science faculty and clinicians are becoming more and more involved with diagnosis and treatment of suspected cases of endocrine maladies related to energy metabolism.

So, what are all these medical conditions? In general, the rise in diagnosis of these and the rise in our awareness of human diabetes have gone hand in hand. Partially, because these diseases, like human diabetes, involve changes in the circulating hormones related to insulin, blood glucose levels, and so forth. I also suspect that as our human conditions go, so do our expectations of our companion animal's conditions, especially when we can easily correlate our general sedentary, overweight lifestyles with the lifestyle of our companion animals.

Equine Metabolic Syndrome is not easily defined in its entirety; hence, the word syndrome in the title. That tells us that there are many possible negative effects or 'conditions' that occur from metabolic disorders and hormone imbalances. Or, EMS might also be viewed as changes in these hormones resulting from conditions of obesity, lack of exercise and genetic predisposition. If your veterinarian can't give you a simple, all inclusive definition of EMS, don't blame him or her. Rather, the inability may be an indication that he or she understands the complexity of the syndrome, and the need to better define the impact of all the complicating factors through quantitative diagnostic tests. In general, EMS is diagnosed, or at least suspected, when horses are kept in an obese state, within certain breeds, when described as 'easy keepers', and/or with a history or current incidence of laminitis. To better diagnose, tests for insulin resistance and/or pituitary gland dysfunction are ran.

Pituitary pars intermedia dysfunction may be stated as 'Cushing's disease', or by its initials PPID. PPID results from lack of function of the pituitary gland, where hormones are released that affect glucose metabolism and distribution in the horse's body. This disease is diagnosed by several tests including blood circulating levels of hormones including insulin and cortisol. There are limitations to tests of insulin and cortisol, as levels of these hormones are affected by several factors including stress and normal variations within times of the day. So, it is likely that diagnosis of PPID will entail more controlled diagnostic tests of responses of hormone levels following dosing with compounds known to impact hormones involved with glucose levels. PPID is usually suspected when older horses have abnormal haircoats (nonshedding, patchy long hair, and so forth), loss of muscle volume, loss of weight, abnormal fat deposits along with other clinically observable conformational signs. Horses may be laminitic (founder episodes) and have related problems with insulin resistance initially indicated by high blood glucose.

Insulin resistance may be easier to grasp, i.e. the name would indicate that the horse's body doesn't respond to insulin in a normal pattern. If this sounds familiar to you, you've likely had experience with human diabetes. Insulin resistance is diagnosed when horses have high blood insulin concentration with normal or high glucose levels at times when the diet intake of sugar and starchy carbohydrates are restricted. As described above, insulin resistance can relate to syndromes or is an indication of dysfunction of the body to remove glucose from the blood, which in turn can have detrimental effects on the function of the body's organs, glands, circulatory system and metabolism of energy in muscle.

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Endocrinopathic Laminitis may be yet another term associated with all these syndromes, conditions and diseases. We owners are familiar with the term laminitis, or as another term used to describe it: founder. Laminitis indicates that structures (laminae) in the hoof are inflamed. Laminitis may be caused by mechanical, nutritional or in this case, secondary to disturbances of the endocrine system, possibly from PPID or EMS. While specific answers to how laminitis results, or why, are not agreed upon by veterinarian researchers, most relate the incidence of endocrinopathic laminitis as part of, or resulting from, conditions of PPID and EMS. It has been theorized to be due to alterations in glucose metabolism in the hoof, alterations in blood flow, or release of enzymes or inflammation agents in the hoof. Obesity is a confounding influence.

All of these conditions, syndromes and diseases affect how we manage our horses. The observed, apparent genetic predisposition to these maladies will continue to be a point of inquiry for genetic researchers. Drug therapies to control insulin response and/or associated hormones will be a point of interest for veterinarian researchers. Management of diet and exercise will be refined further by animal scientists and veterinary researchers. All are in general agreement that diet and exercise have a place in reducing the prevalence of these problems. In general, maintaining horses in obese conditions, i.e. body condition scores in the fat and extremely fat conditions is thought to exasperate the potential for problems. Lack of exercise is likewise a problem. While some forms of these maladies may result with age regardless of management, i.e. PPID, proper nutrition and management will at the least help maintain the horse in as good a condition as possible.

Specifics as to types and levels of exercise haven't been defined in terms of therapy for horses with these conditions. In general, exercise levels and types that are effective to reduce weight in overweight horses are routinely recommended. Answers to how exercise assists the use of glucose in muscle, the efficiency of transport of glucose to and from the blood, and its effect on hormone sensitivity will require much more research before accurate, specific recommendations can be made.

Dietary management centers around control and/or reduction of intake of highly digestible sources of carbohydrates. These include sugars and starches, which are usually found in highest concentrations in grains, and rapidly fermentable fibers, which are found in highest concentrations in lush, immature forage species. Control includes restriction of total caloric intake, or shifting the intake to carbohydrates that are less digestible (fibrous carbohydrates) or more slowly digestible such as the larger fibrous compounds found in mature grassy forages. Control must also take into account the amounts of carbohydrates consumed in one session, i.e. meal size. Larger intakes result in increases of total amounts of carbohydrates, and may overwhelm the capacity of the horse's body to efficiently assimilate resultant increases in blood glucose. So, when a horse is diagnosed accurately and determined to have these conditions, nutritionists and veterinarians will make dietary recommendations to increase the amount of complex, fibrous carbohydrates a horse consumes as a total part of its diet. Levels of intake are adjusted to maintain horses in appropriate body conditions (non-obese). Grazing restrictions are placed on pastures with lush, immature forages by use of grazing muzzles or limited turnout. These and other dietary management recommendations are only as effective as the individual horse shows them to be. Accurate assessment initially and the accurate assessment of the recommendation's effect on the horse's condition have to be made to know the value of management, nutritional or medical therapies.

It seems like scientific discovery in a certain area of health and the prevalence of a medical condition in humans both cause all of us who own horses to assume our horse has that problem. Part of that mindset may be due to our caretaking role, and some weird inherent need for us to include our horse as 'special' and included within an emerging concern. Likely, some of the concern for these maladies related to glucose metabolism in horses are overboard because of this mindset. However, it doesn't take too much investigation to see how our general management of horses can be cause for concern. All horses benefit from exercise, horses need rations aligned with their nutrient needs and horses need routine health checks. If we aren't doing that, we indeed will have a high likelihood of owning horses with these conditions.

*[Much of this article is a result of attending presentations on these subjects at the recently held OSU Horse Owner's Symposium. Appreciation is expressed to OSU Veterinarians for providing these talks, and as a resultant source of information for this article. Horse owners are encouraged to seek additional information through consultation with their attending veterinarian, equine nutritionists and animal scientists.]*

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## **OSU Cowgirl Equestrian teams begin season**

The first 'home show' for the OSU Cowgirl Equestrian team will be October 6th. The team will compete with Baylor at the OSU Animal Science arena in Stillwater. By then the team will have traveled to Auburn and South Carolina to begin the season with a couple of 'away' shows. Home shows for the fall will include matches with Baylor, TCU and Kansas State. All these schools are highly competitive at the national level year end and year out! You can catch up with the Cowgirl activity from last summer, the full upcoming schedule and team information at their website on OSU athletics @ [www.okstate.com](http://www.okstate.com) .

# Learn and Earn

## 4-H Horsemanship Clinic

### 4-H'ers

Learn the basics of proper horsemanship while riding your own horse. Skills included involve handling and care as well as riding safely and effectively on your own. Then work with leaders to complete tasks in the Oklahoma 4-H Horsemanship Levels book and earn an award!

Redlands Royse Ranch, El Reno, Okla.  
November 10, 2012, 10 a.m. - 3 p.m.

No cost to youth or adults. 4-H level manuals will be provided at the clinic and can be viewed online at <http://oklahoma4h.okstate.edu/litol/>

Horseback games lead by  
Redlands Equestrian Team



### Leaders and Parents

Learn how to teach basic horsemanship skills and how to evaluate 4-H'ers according to the Oklahoma 4-H Horsemanship Level guide.

If you want to learn and earn, send your name, county, e-mail and phone number to [david.freeman@okstate.edu](mailto:david.freeman@okstate.edu) before October 10!

Presented by:  
Oklahoma Cooperative Extension Service,  
Redlands Community College and the  
Oklahoma 4-H Horse Council

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