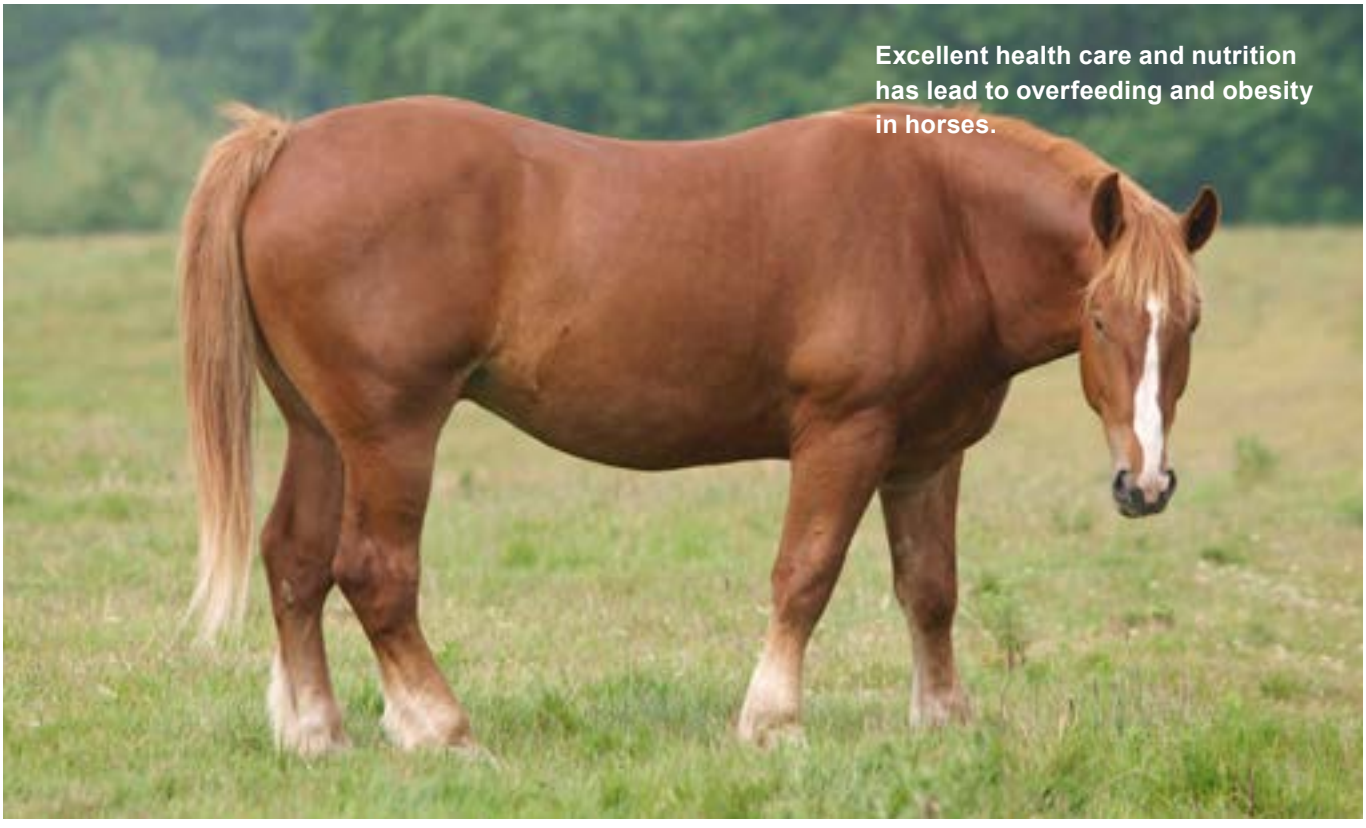

Excellent health care and nutrition has lead to overfeeding and obesity in horses.

Endocrinopathic Laminitis

Use this AAEP Convention presentation to help horse owners whose animals have endocrinopathic laminitis.

By Nancy S. Loving, DVM

There are many problems that veterinarians face, not the least of which are obese horses and laminitis. In this presentation from Teresa Burns, DVM, PhD, DACVIM, she offers advice on nutritional management and therapeutics in horses at risk for or affected by endocrinopathic laminitis.

(Editor's note: This is one of four articles from the 2017 AAEP Convention brought to you by Boehringer Ingelheim Animal Health.)

Availability of excellent health care and nutrition has led to a tendency by horse owners to overfeed their horses. Obesity and insulin dysregulation (ID) often result from an abundance of calories, particularly when intake exceeds the amount of exercise the horse receives. Burns pointed out in her talk that 30% of horses affected with pituitary pars intermedia dysfunction

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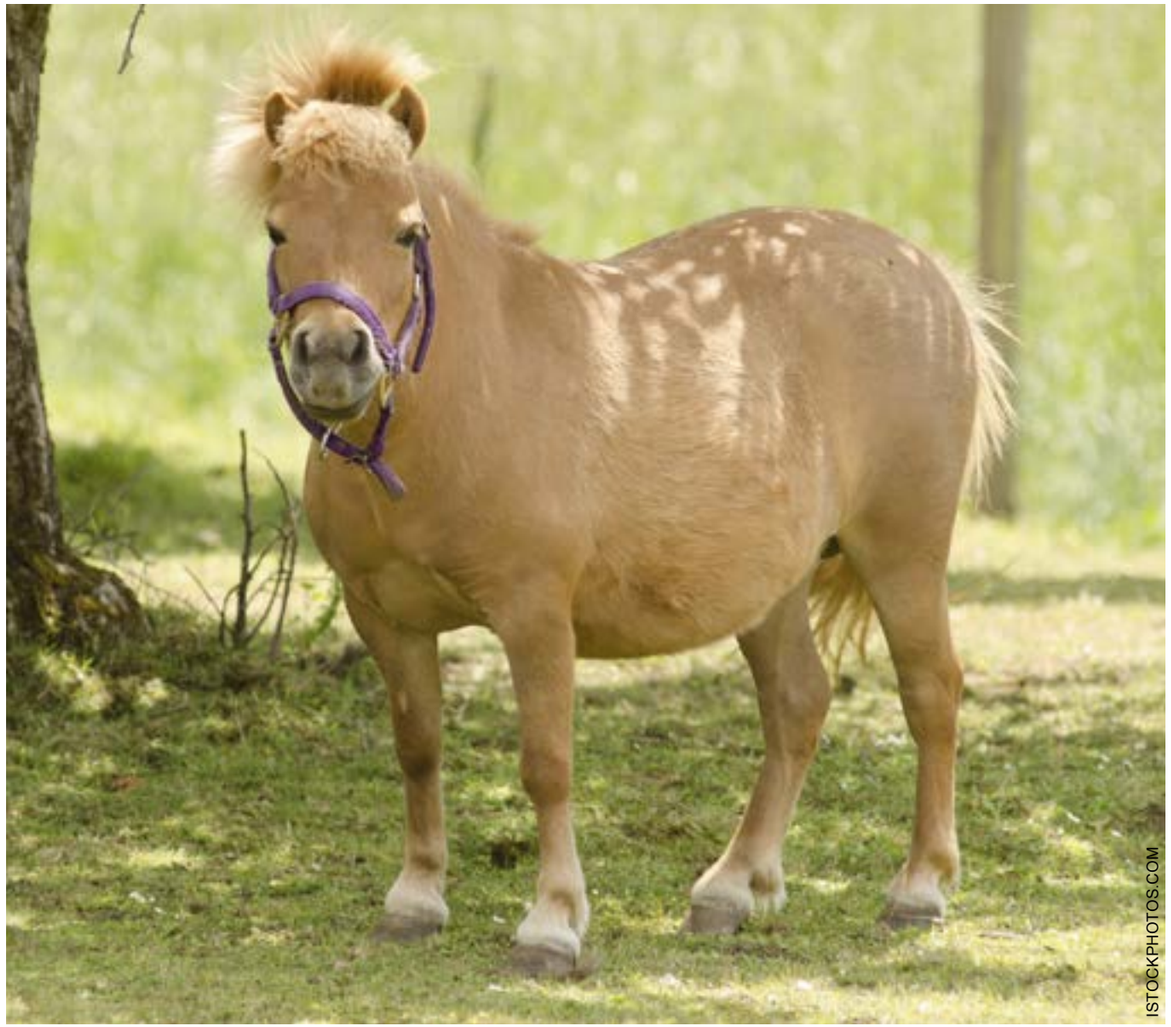

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There are nutritional means to prevent and manage endocrinopathic laminitis in horses and ponies.

(PPID) experience insulin dysregulation, whereas 100% of horses with equine metabolic syndrome have ID.

She described three different forms of carbohydrates found in plants:

- Simple sugars
- Polymeric storage molecules, such as starch and fructans, also called non-structural carbohydrates (NSC)
- Structural carbohydrates, which have no adverse effects on glycemia and therefore should be maximized in the diet

Fructan is the major storage carbohydrate of temperate grasses. It is particularly abundant in pastures in stress conditions, such as bright, cold days.

Feeding appropriately relies on keeping NSC to less than 10% of all dry matter fed. Alfalfa hay has an NSC of about 11.3%, which is comparable to what is found in grass hay, which ranges from 10-15% NSC. None of the commercial concentrate feeds have an NSC below 10%, but horses are usually only fed a limited amount, so the total intake is dose dependent.

One nutritional objective to prevent and manage endocrinopathic laminitis is to decrease the intake of rapidly fermentable carbohydrates. This is accomplished through multiple strategies.

Use concentrate feeds that contain

no cereals or grains. Most commercial feeds are high in NSC. For example, sweet feed is 45-50% NSC, oats are 45-55%, corn is 67-75%, and barley is 60-65%. The post-prandial hyperglycemia that results makes it difficult to achieve weight loss. Some commercially available, low-sugar/low-starch feeds might have NSC of 15%, so it is best to read labels prior to recommending it as a feed.

Restrict access to pasture. In certain seasonal conditions, NSC in pasture grass can be as high as 40%; for example, in high-light, low-temperature (65-70 degree Fahrenheit) conditions of autumn. If any pasture access is allowed, it is best to turn horses out to graze in the early morning when the plants, having used up yesterday's energy, have the least concentration of sugars. Other techniques rely on strip grazing and also the use of a grazing muzzle to limit pasture intake while still allowing turnout.

Testing of the diet for NSC gives the greatest guarantee of what a horse is being fed when trying to achieve weight loss. Feeds tested at 10-12% NSC can be fed at 1-2% of a horse's ideal body weight. If there is no weight loss progress in 4-6 weeks, then decrease the amount fed.

Soaking hay for 3-6 hours and pouring off the supernatant can reduce sugar content by about 20%. One study reduced NSC by 27% when grass was soaked for 16 hours, but there were losses of other nutrients as well, such as electrolytes.

In cases where nutrition fails to achieve an appropriate body condition score and the client has fully complied with the nutritional plan, then it might be necessary to implement pharmacological therapy, said Burns. The goals with medication are to increase insulin sensitivity, to mitigate the effects of hyperinsulinemia, and to encourage weight loss. In some cases, medicine can be used short term while management changes take place; in more refractory cases, medication can be used for longer terms. Examples of drugs that can help with controlling ID for horses affected with EMS:

Levothyroxine, which increases metabolism and stimulates lipolysis in adipose tissue. Because this drug makes a horse more hungry than normal, it is important to restrict forage access. This medication is used only for 3-6 months, then is tapered off over 2-4 weeks.

Metformin (biguanide) While its mechanism of action is not definitively known, it is thought to activate AMPK (AMP-activated protein kinase) to increase insulin sensitivity. It might also work locally in the gastrointestinal tract to limit NSC uptake. However, there is some dispute over its oral bioavailabilty in horses, which can be as low as 4-7%. With that in mind, the recommended dose is 30 mg/kg twice daily, prior to a meal.

A variety of supplements and nutraceuticals (chromium, magnesium, cinnamon) have been proposed to manage EMS, but there is no evidence as to efficacy in their use.

For horses with PPID, in addition to similar nutritional management strategies for EMS, pergolide is the drug of choice. It is a dopaminergic agonist that is given daily to modulate the secretory activity of the pars intermedia. In some refractory cases, it may be necessary to administer cyproheptadine concurrently with pergolide. The half-life of pergolide is 18-24 hours so if an owner stops giving it, then ACTH blood concentration increases significantly within five days. Forty-one percent of owners noted improvement in their horses after two months on pergolide. Over half the PPID horses treated with pergolide are still alive at five years. EM