VETS 90122 INTRODUCTION TO THE VETERINARY PROFESSION

CASE STUDY: EQUINE NUTRITION AND MANAGEMENT

CASE SCENARIO 2: LOTTIE THE PONY

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PRESENTATION AND HISTORY

You are called to visit Lottie, a 13-year-old Welsh pony, to conduct routine vaccination boosters for tetanus and Hendra virus.

The owner reports that everything is well with Lottie, and on clinical examination she appears bright and well. You note that she is quite over-conditioned, perhaps obese, and she has a fat cresty neck. You decide to do a body condition score to document her body condition as part of your examination notes.

Question 1. Refer to the supplementary material on body condition scoring of horses. What body condition score is Lottie?

You comment to the owner that Lottie is a little over-conditioned, and the owner says that she has always been a ‘good doer’, tending to stay quite fat without requiring a lot of feed. A few years ago she used to show Lottie in local country shows, and tended to maintain her in ‘show condition’, keeping a rug on her in winter to keep her coat clean and nice. These days she is kept in a large grass paddock but is not ridden or exercised.

When you examine Lottie’s feet, you notice that there are divergent hoof rings (see photograph below). You ask the owner whether she has ever suffered from laminitis (founder), and she says that a couple of years ago she was a little foot sore for a while on hard ground after having her feet trimmed by the farrier, and she put that down to the trim. She was fine on soft ground.

Divergent hoof rings (wider apart at the sides compared to the dorsal surface of the hoof wall).

You point out that these hoof rings suggest that Lottie may have had some previous episodes of laminitis in the last year, which may have been ‘subclinical’ (i.e. not resulting in noticeable lameness or foot soreness). Nevertheless, you explain that this is cause for concern because she might be at risk of more severe episodes if her diet and body condition are not managed carefully.

Question 2. What is the link between diet, body condition and laminitis?

The owner has heard about laminitis and is aware of how difficult it is to treat and manage. Therefore she is quite concerned about this, and asks what she can do to prevent laminitis occurring. You ask about Lottie's current diet.

DIETARY EVALUATION

Lottie is turned out on pasture most of the time. The grass appears quite green at the moment (see photo below), and the owner reports that the amount of grass in the paddock varies, but is sometimes quite lush.

Lottie also receives 1kg of pelleted concentrate ration per day, to maintain her general condition and provide the necessary vitamins and minerals. You ask what brand of feed she uses, and this turns out to be Barastoc Stable Grain Mix. A friend from pony club had recommended it after using it for her own horse.

In addition, Lottie occasionally receives 20 mL (1/4 of a cup) of vegetable oil in her feed, to improve her coat condition.

ANALYSIS (AS-FED)

Crude Protein (minimum)	12%	Phosphorous (minimum)	0.4%
Crude Fat (minimum)	4%	Vitamin A (added)	5000IU/kg
Crude Fibre (maximum)	6.0%	Vitamin E (added)	20mg/kg
Selenium (added)	0.5mg/kg	Digestible Energy (estimated)	13.0MJ/kg
Calcium (minimum)	1.0%		
Calcium (maximum)	1.25%		

Total analysis contained on bags

INGREDIENTS SELECTED FROM THE FOLLOWING:

Oats, steam flaked barley, steam flaked lupins, steam flaked corn, sunflower seeds, vegetable oil, molasses, KER vitamin and mineral premix, minerals and salt.

Question 3. Why is it not possible to accurately determine the total amount of nutrients that Lottie is receiving? What factors will impact the nutrient intake?

Question 4. Assuming that a pony may eat 2% of body weight per day (dry matter) on this type of pasture, and the digestible energy of unimproved (non-fertilised) pasture may be 7.5 MJ/kg DM at some times of year, how much energy may Lottie be consuming from grass plus the supplementary feed, if she weighs say 300kg? Is this appropriate for this type of pony? (refer to notes on feeding of equines).

You explain to the owner that Lottie is receiving sufficient energy, protein and fibre from the pasture alone, and that the supplementary feeding is providing too much energy, causing her to become obese. (This particular feed is formulated for performance horses, and is high energy/ high starch). Supplementation of vitamins and minerals is appropriate, but this could be done with a pasture balancer ration that is low in energy and carbohydrates.

Furthermore, you explain that levels of non-structural carbohydrates (non-cellulose; i.e. sugars, starch and fructans) in grass may be as high as 25-30% of DM in the spring, which could predispose her to laminitis.

Question 5. What strategies could you suggest that would restrict Lottie's access to pasture or reduce the amount of carbohydrates that she is consuming?

RECOMMENDATIONS

Given that it is currently early spring and Lottie is obese, in discussion with the owner it is decided that she should be taken off the pasture most of the time and kept in a large dirt yard (with a friend who also needs to lose weight).

To encourage weight loss (and lower insulin levels to avoid the risk of founder), Lottie and her friend are fed 1.5 % of BW (4.5 kg each; split into two equal amounts morning and evening) of a moderate quality grass hay per day, which is soaked in cold water for 60 min to reduce water-soluble carbohydrates. The hay is placed in 3 double hay nets spaced around the yard, to encourage her to move around and spread out her intake evenly throughout the day.

Plus they are given a low calorie vitamin and mineral supplement designed for a hay only diet.

When Lottie is allowed out, she is fitted with a grazing muzzle to restrict her grass intake. A picture of a grazing muzzle is shown here.

Lottie is also exercised (ridden or lunged) at least twice weekly.

OUTCOME

It takes Lottie a week or so to get used to wearing the grazing muzzle, but she is fine with it eventually. In summer and winter she is allowed out at pasture all the time without the muzzle. Six months later when you next visit the property, you see that Lottie has lost a significant amount of weight. She is looking very healthy, is perfectly sound and has had no episodes of laminitis.

Question 6. What would you estimate her body condition score to be now?

DISCUSSION

Most modern pastures are not ideal for many ponies, because they can be very high in non-structural carbohydrates, which are digested in the stomach and small intestine to release glucose and fructose, which lead to high insulin levels and insulin resistance. Non-structural carbohydrates include sugars (glucose, sucrose, fructose), starch (high in clover or lucerne; relatively low in grasses) and fructans (a fructose polymer that is the main storage carbohydrate in grasses, rather than starch). Structural carbohydrates include cellulose and hemi-cellulose, which contains glucose units that can only be released slowly by hindgut bacteria, producing VFAs.

Laminitis is the stretching/separation of the supporting structures of the hoof wall, and results in crippling lameness that can be very long term and difficult to manage. Many ponies get laminitis when they are kept on pasture all year round, and a survey of ponies in Victoria showed that 15% of ponies had previously suffered an episode of laminitis. Welsh ponies are over-represented in these findings – they have genes that contribute to their 'thrifty phenotype', with a strong insulin response to non-structural carbohydrate in the diet. This predisposes them to obesity and laminitis – the so-called 'Equine Metabolic Syndrome' (EMS).

These ponies, even if they are in light work, do not require supplementary feeding for energy (they are VERY metabolically efficient), and grain-based feeds in particular should be avoided. They usually require vitamins and minerals only – protein may also be supplemented at some times of year if necessary for muscle development if in work. In the wild, ponies like these would naturally lose weight over the winter when pasture carbohydrate/protein levels are lower and put on weight in spring (breeding time). However, most owners keep condition on by feeding over the winter and keeping rugs on etc, which means they are already over-conditioned at the start of spring, and become even more obese on lush grass, eventually succumbing to laminitis (founder).

As discussed in this case, several different strategies may be considered for restricting pasture intake, such as strip grazing, grazing muzzles. But once a pony or horse has had an episode of laminitis it is at even grater risk of getting it again, so these animals usually have to be managed on dirt yards with hay (lower CHO /MJ than grass). Soaking hay can be useful to reduce sugar levels. Some ponies are very greedy and can consume their entire daily intake of grass in 3h if they know that access is being restricted, so restricted grazing is not always successful!

FURTHER READING

The latest on feeding laminitic horses. Sarah Evers Conrad. *The Horse.com Magazine* (May, 2020). The Latest on Feeding Laminitic Horses – The Horse

Strip-grazing reduces pony dry matter intakes and changes in bodyweight and morphometrics. Annette C. Longland, Clare Barfoot and Patricia A. Harris. Equine Veterinary Journal 2020 DOI: 10.1111/evj.13416