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09.25–09.50

Managing weight loss in the hyperinsulinaemic pony

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Hyperinsulinaemia is a cardinal feature of insulin resistance. Obesity (BCS $\geq 7/9$), is associated with an inflammatory state and insulin resistance, although not all obese animals are insulin resistant and not all insulin resistant animals are obese, e.g. those with PPID. However 40–50% of the domestic horses and ponies in the UK are now considered overweight or obese.

The consequences of insulin resistance and hyperinsulinaemia include endocrinopathic laminitis and a predisposition to pasture-associated laminitis. While the exact mechanisms of pasture-associated laminitis remain to be determined, insulin resistant animals display exaggerated glycaemic and insulinaemic responses to dietary starches and sugars.

For overweight, insulin resistant animals, weight reduction is initially managed by dietary restriction, combined with physical exercise when possible.

Weight reduction programmes

- The owner/carer must be committed for the long-term and must be aware that there is no quick fix. A detailed history of the feeding protocol and work level should be obtained.
- Feed analysis (hay/haylage) enables more accurate calculations of future, regulated intakes.
- The readily available carbohydrate content of the feed also requires careful consideration.
- Monitor at least monthly: BM (weighbridge or weight tapes [accurate to ± 50 kg]), BCS, and girth (neck, trunk).

What to feed

- Removal from pasture is preferable to enable good control over food intake, although limited turn-out on graze-poor paddocks may be all that is available. (Beware soil/sand intake on muddy/sandy pastures.)
 - Use of grazing muzzles reduces food intake, but ensure animals can drink water and beware of herd hierarchy changes.
- Offer a forage (low energy density)-based diet. Avoid high starch/sugar diets which have a high glycaemic/insulinaemic index and promote hyperinsulinaemia.
 - Each portion must be weighed, not eyeballed.
 - No tit-bits (carrots, apples) allowed.
 - Hay can be soaked to try to remove some of the soluble carbohydrates, but the effect of soaking may depend upon the maturity and fibre length of the forage, in addition to the soak volume, temperature and time. Valuable minerals may also be leached out, so that mineral supplementation is recommended. (In order to avoid over-restriction of protein/essential amino acids, a balancer with protein, vitamins and minerals is usually recommended).
 - Caloric dilution by addition of straw (relatively indigestible fibre) remains controversial because of the risks of gastrointestinal impaction colics and stomach ulcers. Straw bedding and faeces, however, will likely be ingested by food-restricted animals, as will wood-shavings.
- Feed little and often (if practical) to reduce boredom and try to extend total eating time.
 - Use multiple, doubled, small-hole haynets at different positions in the stable.
 - Use manger obstacles to slow down food intake and allay boredom.

- Stable toys may help reduce boredom.

- Use winter as the natural aid to weight loss: turn out as much as possible (as long as pasture is sparse); don't rug up, consider trace-clipping; but beware sudden cold stress as this may precipitate laminitic episodes.

How much to feed

For weight reduction, most researchers have suggested cautious food restriction because of the potential complications for trickle-feeders, i.e. stereotypies and stomach ulcers. Up until recently, based on the evidence that most grazing horses will eat around 2–2.5% of their body mass (BM) as dry matter per day, restriction to around 1.3–1.5% of BM as dry matter intake (DMI) has been suggested.

A 'safe' rate of weight loss is often advocated as 1% of BM per week. Several equine studies targeting such a rate suggest that dietary restriction can safely be initiated at 1.25% BM as daily DMI, with further restriction to 1% BM as daily DMI if weight loss is negligible after the first month. Some animals will likely eat bedding or display coprophagia but adverse effects following these behaviours or the development of overt stereotypies should be rare. Hyperlipaemia should also be avoided.

Exercise

Exercise combined with dietary restriction will promote weight loss and improvements in insulin sensitivity but may be contraindicated in some horses/ponies due to laminitis. Reported effects of exercise on equine insulin sensitivity, however, are often confusing, possibly due to different levels of exercise, different body condition scores of animals recruited and different tests of insulin sensitivity being used and, in this author's opinion, particularly whether animals were starved before testing (which can itself increase insulin resistance).

Other strategies

For laminitic animals unable to exercise and/or where weight loss is very slow despite severe dietary restriction, then additional treatments may be considered: thyroid hormone supplementation or metformin.

Further reading

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