

QUESTION: Do blood glucose and insulin responses to high and low glycaemic index carbohydrate supplements differ?

Background

- Foods with a high glycaemic index (GI), such as those containing high amounts of dietary starch, release sugar rapidly whereas low GI foods release energy more slowly.

Aim of Study

To determine the blood glucose and insulin responses to administration of a low GI, slow release carbohydrate supplement (EnerGex, Science Supplements) compared with an equivalent energy load of high GI carbohydrate (sugar).

Study Design

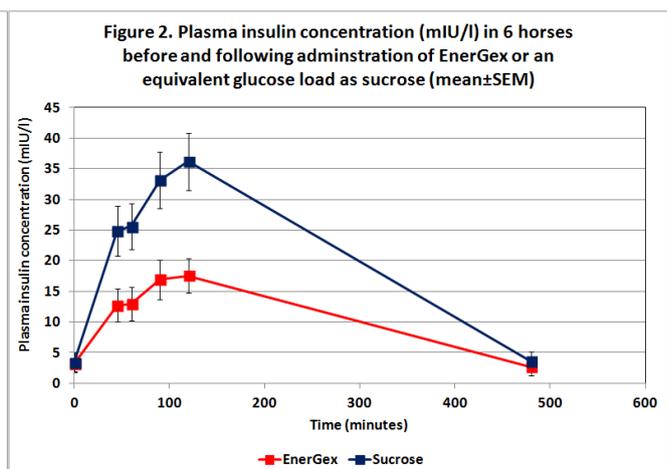
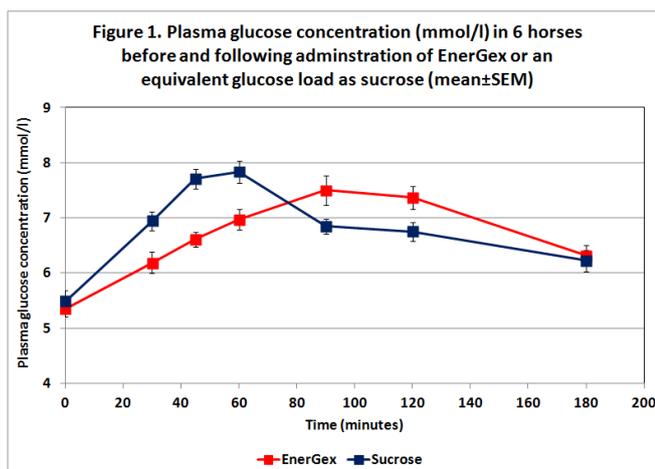
- *Double-blind* = none of the clinicians or data analysts knew which supplement any given horses received on each test days. Blinding reduces bias caused by people wanting to see a positive effect with the treatment under investigation.
- *Crossover trial* = all horses received both low and high GI carbohydrates allowing the response of a horse to low GI carbohydrate to be compared with the same horse's response to high GI carbohydrate. Removing horse to horse variation in this way makes crossover trials potentially more efficient than similar sized, parallel group trials in which each horse is exposed to only one treatment.
- *Washout* = the time between treatments (low/high GI carbohydrate). A washout period of time allows the treatment from the first period to be washed out of the patient's system.

Study Outline

Six clinically healthy horses were randomly allocated to receive a one-off dose of 1g per kg bodyweight of either sucrose (sugar) or EnerGex. These carbohydrate supplements were dissolved in 4 litres of water and given by stomach tube. Serial blood samples were taken before and at 0, 30, 45, 60, 90, 120, 180, and 480 minutes following administration of carbohydrate for later glucose and insulin measurement. After a 48 h washout period, all horses then received the other carbohydrate solution and blood sampling as previously described.

Results

- Blood glucose (Fig. 1) and insulin (Fig. 2) concentrations increased more slowly with EnerGex compared to sucrose.
- Glucose concentration at 45 min was significantly lower with EnerGex compared with sucrose. Blood glucose concentration peaked later (90-120 min) with EnerGex compared to sucrose (60 min) (Fig. 1).
- Blood insulin concentration showed a plateau around 45-60 min with both EnerGex and sucrose, and a peak concentration around 120 min (Fig. 2).



Take Home Message

- The low GI carbohydrate supplement EnerGex results in a more controlled and sustained rise in blood glucose than an equivalent load of sugar provided as sucrose.
- EnerGex induces considerably less metabolic disturbance as shown by a 50% lower insulin response. This response makes EnerGex suitable for use in horses during or following exercise, in cases where hindgut function is compromised, in horses with depressed appetite as a result of illness or stress (e.g. transport, stabling away at competitions) and as an adjunct or alternative to parenteral nutrition of feeding via nasogastric intubation.