- STARCH INFORMATION SHEET -

REVERDY

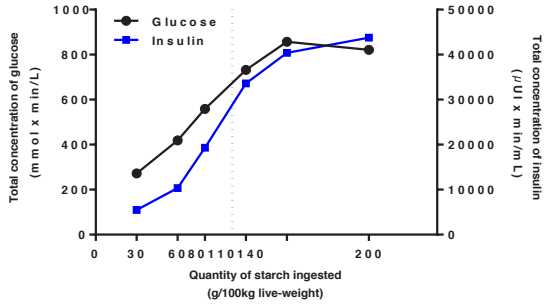
MANAGING HORSES WITH METABOLIC DISORDERS

STARCH AND THE METABOLISM OF GLUCOSE

LIMITING THE METABOLIC RESPONSE IN A HEALTHY HORSE

More the quantity of starch ingested during a meal is high, the more the blood concentration of glucose (glycaemia) and insulin (insulinaemia) increases, in particular from 100g per 100kg live-weight[1]. Thereafter, a plateau seems to appear between 140 and 200g of starch per 100kg live-weight.

Total glucose and insulin concentrations depending on the quantity of starch ingested during an 8 hour period following a meal.



The concentration in the blood stream of glucose and insulin increases with the quantity of starch distributed

STARCH AND METABOLIC DISORDERS

However, in horses suffering from metabolic disorders, such as Cushing's disease and equine metabolic syndrome (EMS), the glycaemic and insulinaemic responses that can take place after a meal must be minimized. **Indeed, horses with metabolic diseases are in general insulin-resistant.** This signifies that they experience difficulty in regulating their glycaemia after a meal, it therefore increases more and/or remains higher longer than in healthy horses.

A study demonstrated that the inflection point from which the metabolic response showed a linear increase was 30g of soluble sugar per 100kg de live-weight[2], even though it was situated around 60g of starch in the previously presented study[1]. As the source of starch (oats, barley, wheat, maize…) and treatment undergone by cereals (crushing/rolling, flaking…) also have an influence over the metabolic response, it is more sensible to use as a basis the lowest inflection point in order to minimize risks[3].

REVERDY ADVISES

- **Within healthy populations of horses, it is recommended to not exceed 100g of starch/100kg live-weight to limit the amplitude of metabolic responses.**
- **In overweight or obese horses needing to lose weight, make the most of a forage only diet accompanied by a vitamin and mineral supplement.**
- **If the horse suffering from a metabolic disease does however require an extra source of energy in addition to hay in order to maintain optimum condition, it is advisable to limit starch at each meal to a maximum of 30g per 100kg live-weight.**

The recommended quantities in the table below have been calculated taking into consideration both the starch provided, as well as the size of the stomach (do not exceed 400g/100kg live-weight of feed per meal).

		Maximum quantity per meal based on the weight of the horse		
	REVERDY feed	400 kg	500 kg	600 kg
Limit the metabolic response in a healthy horse	Adult	2 litres (1.4 kg)	2.5 litres (1.8 kg)	3 litres (2 kg)
	Adult Energy	1.5 litres (1 kg)	2 litres (1.4 kg)	2.5 litres (1,8 kg)
	Racing	2 litres (1.4 kg)	2.5 litres (1.8 kg)	3 litres (2 kg)
	Training	2 litres (1.4 kg)	2.5 litres (1.8 kg)	3 litres (2 kg)
	Adult Specific Energy	2.5 litres (1.8 kg)	3 litres (2 kg)	3 litres (2 kg)
	Breeding	2 litres (1.4 kg)	2.5 litres (1.8 kg)	3 litres (2 kg)
Managing a horse suffering from a metabolic disease	Adult	0.3 litres (210 g)	0.4 litres (260 g)	0.5 litres (320 g)
	Adult Specific Energy	0.6 litres (430 g)	0.8 litres (540 g)	0.9 litres (640 g)
	Breeding	0.3 litres (210 g)	0.4 litres (260 g)	0.5 litres (320 g)

TO LEARN MORE

1. Vervuert, I., Voigt, K., Hollands, T., Cuddeford, D. & Coenen, M. Effect of feeding increasing quantities of starch on glycaemic and insulinaemic responses in healthy horses. Vet. J. 182, 67–72 (2009).
2. Hoffman, R., Haffner, J., Crawford, C., Eiler, H. & Fecteau, K. Nonstructural carbohydrate and glycemic response of feeds: how low is "low" starch? J. Equine Vet. Sci. 29, 379–380 (2009).
3. Geor, R., Harris, P. & Coenen, M. Equine applied and clinical nutrition: health, welfare and performance. (Saunders, 2013).

"BUT ALSO…"

- **Distribute a food source rich in omega 3 fatty acids (for example flaxseed),**
- **Support the intestinal microbiota with appropriate supplements (FLORE),**
- **Strengthen the supply of antioxidants (vitamin E and selenium) (E NATURELLE, E SELENIUM), up to 10g of vitamin E per day for horses suffering from a metabolic syndrome.**