



RISK FACTORS

- Donkeys (inherently insulin resistant).
- Small pony breeds – Shetlands, Welsh Mountains and Miniature ponies.
- Underlying primary disease.
- Rapid weight loss.
- Dental disease.
- Increasing age (uncommon in donkeys < 18months).
- Stress e.g. Transport, management changes, separation anxiety.
- Feeding concentrates.
- Pregnancy and lactation.
- Obesity.
- Type of bedding (increased risk with cardboard bedding).

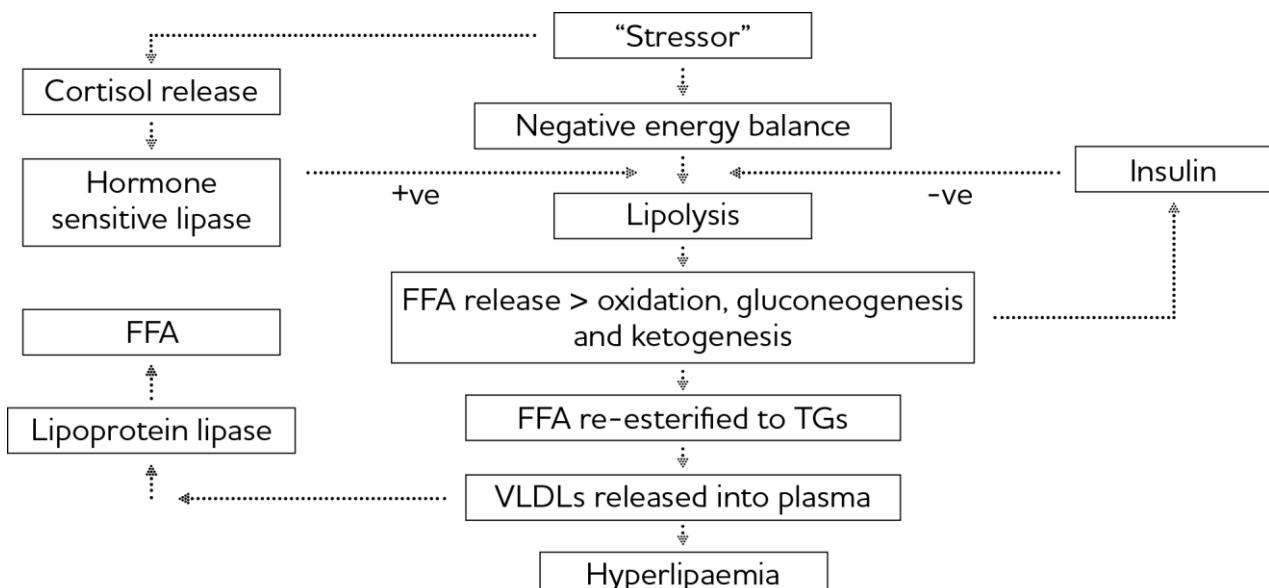
PATHOPHYSIOLOGY

The condition of hyperlipaemia is defined by elevated plasma triglycerides (TG), potentially leading to the fatty infiltration of organs and subsequent organ failure.

This elevation in plasma triglycerides is a consequence of a series of events, arising during periods of negative energy balance (which can be initiated by the risk factors outlined above). In such periods the activity of hormone sensitive lipase (HSL) is increased, mobilising adipose tissue. Concurrently, there is peripheral insensitivity to the action of insulin, which normally inhibits lipolysis.

The mobilisation of body fat by HSL results in increased levels of circulating free fatty acids (FFAs). Unlike in bovines, equidae have limited ability to convert non-esterified fatty acids into ketones.

Instead, the liver re-esterifies the FFAs to TGs and very low density lipoproteins (VLDLs); release of this TG and VLDL into the bloodstream leads to hyperlipidemia. If this cycle continues and there is decreased clearance of VLDL, hyperlipaemia results. To counteract the cycle the initiating cause should be identified and treated and the negative energy balance must be corrected. This process can be summarised in the diagram below:



Factors that increase activity of HSL:

- ACTH;
- Glucocorticoids;
- Catecholamines;
- Glucagon;
- Growth Hormone; and
- Thyroid Hormone

NB: Obese animals have a higher resting TG level and are less sensitive to insulin. Pregnancy and lactation reduce insulin sensitivity.

CLINICAL SIGNS

- Dullness, lethargy, inappetence when offered food/ “sham” eating and drinking (vague clinical signs can be seen in early stages).
- Cloudy to milky serum/plasma as severity increases.
- Depression.
- Anorexia.
- Halitosis, characteristic smell associated with ileus.
- Gut stasis/ abdominal discomfort.
- Congested membrane mucous, delayed capillary refill time.
- Dry mucous covered faeces/dry faecal balls.
- Muzzle and head oedema (after prolonged periods of dullness).
- Tachycardia.
- Tachypnoea.
- Ataxia.
- Hepatic encephalopathy.
- Recumbent.
- Death.

TREATMENT

Consider severity of hyperlipaemia and prognosis (for both hyperlipaemia and any primary disease) before starting treatment.

Serum Triglyceride	Approach to treatment	Prognosis
3-8 mmol/l	Encourage voluntary feeding, glucose drenches	Triglyceride level should restore quickly to normal if feeding continues
8-10 mmol/l	Nasogastric intubation	Good
10-15 mmol/l	Nasogastric intubation +/- IV fluids	Fair if triglyceride levels are reduced promptly. Treat aggressively
15-20 mmol/l	Nasogastric intubation and IV fluids	Guarded
>20 mmol/l	Intensive IV fluids	Poor

Prognosis is improved if there is voluntary food intake. Encourage with treats (ginger biscuits, grated apple/carrot and jam sandwiches), grazing or hand feeding. Owner attitude is vital. Prognosis improves if the owners are willing to hand feed, oral drench and administer oral medications.

Drench using a 50ml drenching syringe at least 3-4 times a day. Dissolve 100g glucose powder in warm water (try flavouring if possible). Small volumes as often as possible are ideal. Avoid any extra stress to the affected animal by keeping a companion close by. Assess the likely stress of hospitalising a patient; it may be preferable to treat at home. Corticosteroids are always contraindicated.

NASOGASTRIC INTUBATION

If gut activity is present, fluids are ideally administered via nasogastric intubation. A pony or foal size tube is best. At The Donkey Sanctuary our standard recipe is as follows.

- 2-3L warm water (approx. 1L/75kg body weight).
- Rehydration salts (e.g. Effydral™ or Lectade™).
- 120g glucose powder (note that Lectade™ contains approx. 50g glucose).
- 250-500g Ready Brek (top tip – add the Ready Brek to the water at the last minute to prevent excessive thickening and blockage of the nasogastric tube. Stir well).
- Any other oral medication to save drenching later.

INTRAVENOUS FLUIDS

Maintenance rate is 60ml / kg / 24hr. As it is not always possible to run IV drips continuously in a field situation, at The Donkey Sanctuary we often use a bolus of 3-4 L given over 60-90 minutes and repeated 2-3 times daily. The drip bags are spiked with 40% glucose solution for injection and Duphalyte®, both at 1-2ml /kg.

Weight of donkey	Max Fluid amount per 24 hours (IV + NG)	Glucose / Duphalyte volume per IV bolus
150kg	9 L	150-300 ml
175kg	10.5 L	175-350 ml
200kg	12 L	200-400 ml

ADJUNCTIVE TREATMENTS

NSAID's

Flunixin meglumine at a minimum anti-endotoxic dose [0.25mg/kg] every 6-12 hours. With primary pyrexia, inflammatory or painful cases, administer the usual dose of 1.1mg/kg.

Anti-ulcer medication

Most cases showing inappetence will benefit from anti-ulcer medication as it is a common finding at post-mortem in elderly or debilitated donkeys.

- Omeprazole 'Gastroguard' is the drug of choice, given once daily at 4mg/kg. Expensive.
- Sucralfate 'Antepsin' could be used at 10ml orally every 8-12 hours.
- Ranitidine 'Zantac' can be used in oral form, 2-3 x 300mg tablets every 12 hours.

Multivitamins

Oral general-use equine multivitamin preparation dosed at bodyweight. Injectable multivitamins can be given, but may add to stress.

Anabolics

Nandrolone Laurate BP at 1 mg/kg can act to stimulate appetite and counter catabolism.

If the patient is hospitalised, total parenteral nutrition can be considered. We can provide a separate guide for this, please contact the veterinary department on 01395 579162 or email vets@thedonkeysanctuary.org.uk.

Should you require further information please contact the Veterinary Department, Slade House Farm, Sidmouth, Devon EX10 0NU, by telephone on +44 (0)1395 579162, or by email to vets@thedonkeysanctuary.org.uk