

RENAL AND HEPATIC DISEASE

ETIOLOGY

- Renal disease is not very common in horses. Hepatic disease is slightly more common.
- Renal disease is usually brought about secondary to toxicities that cause necrosis to the kidneys. This can include:
 - Nephrotoxic drugs such as the aminoglycoside antibiotics, sulfonamides or non-steroidal anti-inflammatory drugs
 - Heavy metal poisoning such as lead, arsenic and mercury
 - Myoglobin accumulation from muscle breakdown in horses with recurrent exertional rhabdomyolysis or in those that sustain large muscle injuries and those that accumulate hemoglobin from blood destruction as with the ingestion of toxic plants such as dried or wilted red maple leaves
- Renal disease can also be caused by a lack of blood supply to the kidneys such as may occur with endotoxemia associated with colic or following sepsis.
- Renal or cystic calculi can cause renal failure.
 - Horses normally excrete excess dietary calcium in their urine instead of the feces as most other species do.
 - If kidney disease is present, renal and bladder calculi are more likely to occur, as well as an increase in blood calcium, which can be lethal.
 - Horses that graze sorghum species many times suffer from kidney and bladder problems.
- Chronic hepatic disease may be caused by ingestion of toxic substances. These may include plants such as Senecio and Kleingrass.
 - Mycotoxins, such as aflatoxin and fumonisin are also hepatotoxic.
- Some diseases, such as equine rhinopneumonitis, and obstructions of the biliary system can also cause liver disease.
- Hyperlipemia with fatty infiltration of the liver is seen commonly in ponies and is associated with obesity.

SYMPTOMS

- Clinical signs of renal and hepatic disease include:
 - Weight loss
 - Loss of appetite
 - Lethargy
 - Drinking more water
 - Jaundice (from hepatic failure)
 - Hepatoencephalopathy (from hepatic disease) due to decrease plasma concentration of branched-chain amino acids and aromatic amino acids as well as ammonia increase.

DIETARY RECOMMENDATIONS

HEPATIC DISEASE

- Horses with hepatic disease must be fed easily digested soluble carbohydrate sources and should be offered multiple feedings to maintain blood glucose levels homeostasis and reduce mobilization of body glycogen and fat. Added fat diets are not indicated.
- Legume hay should be avoided in the diet of horses suffering from hepatic disease because of high levels of aromatic amino acids.
- Horses with hepatic disease should be offered a diet with a protein source that has a high branched - chain to aromatic amino acid ratio.

- Horses with hepatic disease that are inappetant should be tempted with a variety of feedstuffs until their appetite returns. In horses with HE or for longer-term management, dietary modification to provide a diet without excessive protein and in which the ratio of BCAA:AAA is optimized should be fed. This will minimize AAA entry into the brain (where they can contribute to HE by acting as precursors for the inhibitory neurotransmitter serotonin as well as for false neurotransmitters). This ratio has been taken into consideration when developing our feeds and supplements.
- Horses with hepatic failure should be supplemented with oral B-complex vitamins and ascorbic acid as the liver is the site for vitamin C and niacin synthesis (Horse Plus).
- Feed grass forage rather than alfalfa with a vitamin/mineral supplement only to avoid feeding excess protein, calcium and phosphorus for both disorders.

- A feed containing beet pulp, corn, oats can form the mainstay of these diets. Simplici-T Fibra is a well-balanced feed for horses with hepatic failure.

KIDNEY DISEASE

- Horses with renal disease should be maintained on a strict diet to limit calcium, protein (8 to 10%) and phosphorus.
- Feeding legume hay (high in calcium) or excess protein does not cause kidney disease in horses that are healthy, but is not recommended for horses with renal or hepatic disease. Preferably use a good quality grass hay.
- Avoid feeds with beet pulp (high in calcium) and wheat bran (high in phosphorus) due to their high protein, calcium and/or phosphorus content.
- Use caution with salt supplementation as some horses may overeat salt with either of these conditions. It may be preferable to add one to two ounces of salt to concentrate ration daily.

SUGGESTED PURINA PRODUCTS

FEED NOTES

- Limit high intake of protein, calcium and phosphorus for both diseases
- Avoid high-fat diets
- Control salt intake
- Provide highly digestible soluble carbohydrates for hepatic disease.
- Supplement with oral B-complex vitamins and ascorbic acid for hepatic failure.
- Feed with grass forage and avoid legumes, beet pulp and wheat bran due to high protein, calcium and/or phosphorus content.

Recommended:

SIMPLICI-T FIBRA
and **EQUILIBRIUM EQUILIZER**
for liver disease
with added **HORSE PLUS**.

SIMPLICI-T FIBRA
for kidney disease.

SUPERFIBRA NATURE
is also suitable



Supplement:

Consider using **EQUI22**
as a vitamin and mineral source
without added calcium or phosphorus.



NOTES: The selection of these Purina feeds meets the nutritional guidelines for the management of these equine diseases. These feeds are low in protein, fat, calcium and phosphorus. The addition of Horse Plus in these formulations provides the maximum requirements of B-complex vitamins, vitamin C (ascorbic acid), and vitamin E.

FEED RATE PROTOCOL NOTICE

This feeding protocol described here pertains only to Cargill Limited Horse Feeds. There is not established feeding protocol that all feed companies must follow. Purina provides two feeding rates on their tag a "Minimum" and a "Purina Superior". The "Minimum" meets the levels established by the NRC Nutrient Requirements of Horses (2007), which will prevent all classic nutritional deficiencies. The "Purina Superior" is a greater level of fortification that promotes an optimal level of performance and immunity. By no means does that imply "Minimum" is subpar, and for the non-competitive horse, that stays home year round and has no health issues there is probably no need to exceed this level. However, if you are feeding a true equine athlete, with all the immune stresses associated with that level of competition, then the "Purina Superior" level is paramount to ensure an optimal level of performance and immunity.