Folate and Cobalamin in the diagnosis of chronic GI disease in Cats and Dogs

Serum cobalamin and folate analysis can be useful in the work-up of patients with gastrointestinal (GI) disease. Stores for both vitamins are high in the healthy animal and deficiencies don't develop unless disease is severe and chronic.

Cobalamin (Vitamin B_{12})
Cobalamin is bound to dietary protein and is released by gastric acid and proteases. The free compound binds to Intrinsic Factor (IF) before absorption in the ileum. Proprietary companion animal diets are rich in B_{12}, and dietary deficiencies are rare except in animals maintained on vegetarian/vegan diets. Rather, a B_{12} deficiency develop as a consequence of reduced absorption following a fall in IF concentration, ileal dysfunction or intestinal dysbiosis.

Intrinsic Factor

Since all feline and most canine IF is manufactured in the pancreas, patients with exocrine pancreatic insufficiency (EPI) can develop cobalamin deficiency.

Ileal Disease

Receptors for cobalamin absorption are found **only** in the ileum and severe disease in this segment of the intestine can reduce vitamin uptake.

Dysbiosis

Small intestinal bacterial overgrowth (SIBO) can follow EPI, reduced gastric acidity, local inflammation and altered mucosal immunity. Bacteria compete for B_{12} and increased numbers can decrease availability. Many bacteria synthesise folate and elevated serum folate concentrations can also be seen in SIBO.

Cobalamin deficient enterocytes

Cobalamin deficient enterocytes are less able to absorb B_{12}, and vitamin half-life is reduced thus worsening a deficiency. It is thought that cobalamin deficiency contributes to GI disease because a reduction in GI signs and weight gain have been noted in cats treated with cobalamin only.

Note Pancreatic enzyme extracts don't ensure cobalamin will return to normal, and weight loss or GI signs may continue. Consequently, serum cobalamin should be checked in animals with EPI showing a poor response to enzyme replacement therapy.

Note B_{12} is higher in serum than tissue so animals with low-normal serum levels may be deficient.

Folate

Folate is absorbed in the proximal small intestine and low serum concentrations are a marker for disease in this area of the GI tract. Small animal diets are high in folate and dietary deficiencies don't typically occur. Deficiencies are less commonly seen

compared to B_{12} and the effect of folate deficiency has been less intensively studied, however supplementation is usually provided to animals with low serum concentrations.

Main points
Deficiencies in folate or cobalamin can take months to years to develop and GI disease cannot be excluded based on normal concentrations
Abnormalities do not provide a specific diagnosis but indicate chronic, severe small intestinal disease
Low serum levels suggest a need for parenteral supplementation.
There is no clinically significant difference in analyte concentrations between fed and fasted samples