

Testing and Monitoring Thyroid Function—1



Fat, lazy dogs and thin, cross cats are as common as ever, judging by the number of blood samples we continue to receive for thyroid function tests!

This month's focus is a thumb-nail guide to testing, then next month we shall explore thyroid monitoring.

Investigation of thyroid function is not straightforward, especially in dogs, which is why NWL offers a range of thyroid profiles. Concurrent non thyroidal disease and/or therapy with glucocorticoids, NSAIDs, sulphonamides or barbiturates reduces blood levels of total T4 (thyroxine). Additionally, total T4 levels in healthy dogs can fluctuate below the reference range on a daily basis. Also, older dogs and sight hounds have lower total T4 values.

Measurement of total T4 alone, although sensitive for canine hypothyroidism, has only 70% specificity — ie lots of false positives! Total T4 alone is, however, a suitable initial test for feline hyperthyroidism.

In 80% of dogs with primary hypothyroidism, as total T4 is reduced, endogenous TSH levels increase due to a lack of regulatory negative feedback on the pituitary.

Combining total T4 assay and endogenous TSH testing is therefore a very helpful initial approach in dogs.

Free T4 by equilibrium dialysis is less affected by non thyroidal illness or drug therapy than total T4 in both dogs and cats—hence it is more diagnostically specific, BUT it is less sensitive and therefore should not be used alone to assess thyroid function in either species.

Free T4 by equilibrium dialysis is a particularly helpful added test in dogs where total T4 is low, but endogenous TSH is normal, and in cats with clinical signs of hyperthyroidism but upper normal range total T4 results.

Antibodies to normal thyroid tissue, including thyroglobulin, occur in lymphocytic thyroiditis in dogs, so the presence of thyroglobulin autoantibodies (TgAAs) confirms active thyroid pathology BUT does not give an indication of thyroid function. Up to 50% of hypothyroid dogs are TgAA positive at diagnosis, but again there are breed and age variations and a negative result does not rule out disease.

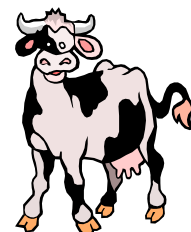
Thyroglobulin autoantibody testing is especially useful in dogs where total T4 is low but TSH is normal and also in dogs on concurrent therapy.

For more information, see the recent article (*In Practice* 31: 77-82 (2009)) by our Managing Director, Dr Peter Graham, who is an expert in endocrinology.

LDA and NEFA

We recently processed blood samples at NWL Leeds from a dairy herd with a high incidence of left displaced abomasum (LDA). Routine biochemistry results from the dry cow group were unremarkable apart from high levels of non esterified fatty acids (NEFA). Increased levels of NEFA are associated with fatty liver or any situation where body fat is hydrolysed as a response to underfeeding. Plasma NEFA concentrations one week prior to calving can predict post partum metabolic disease.

A pre calving NEFA value of >0.5 mmol/l carries a 3.5 times greater risk of the cow developing a displaced abomasum.



Cows with NEFA values >0.7 mmol/l pre calving have a five fold increased risk of developing subclinical ketosis, as defined by a beta hydroxybutyrate (BHB) level of >1.4 mmol/l—in this herd, a number of cows in the early lactation group were shown to have high BHB values.

NWL Clin Path Club

The next North West region meeting will be at 8.00 pm on 24 Sep 09 at The Marriott Hotel, Preston (new venue).

Ian Wright will speak on 'Toxocariasis...still in the public eye?'