THYROID SECRETORY ACTIVITY

Although thyroid enlargement due to adenomas (or occasionally adenocarcinomas and C-cell tumours) is seen not infrequently in older horses, functional thyroid disease resulting in hypo- or hyper-thyroidism is an extremely rare condition. Reduced thyroid secretory activity, when it does occur, is likely to be secondary to other factors, such as co-existing non-thyroidal illness or drug treatment (e.g. phenylbutazone). Evaluation of thyroid function is extremely difficult and complex. Problems could potentially arise anywhere between the hypothalamic secretion of TRH, the *pars distalis* secretion of TSH, thyroid gland secretion of T4 and T3 and the peripheral action of free T3 and free T4. Firm establishment of abnormality at any of these levels is however very difficult.

Resting levels of total or free T3 and T4 are often the starting place for assessment of thyroid secretory activity, an assessment of thyroid secretory activity that in reality give very little useful information.

TRH stimulation test

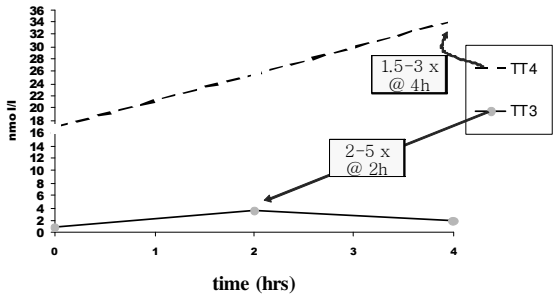
Suspected hypothyroid subjects are probably best assessed using the TRH stimulation test.

Protocol

- Collect baseline serum sample
- Inject 1 mg of TRH ("Protirelin") iv
- Collect further serum samples at 2 and 4 hours after TRH injection

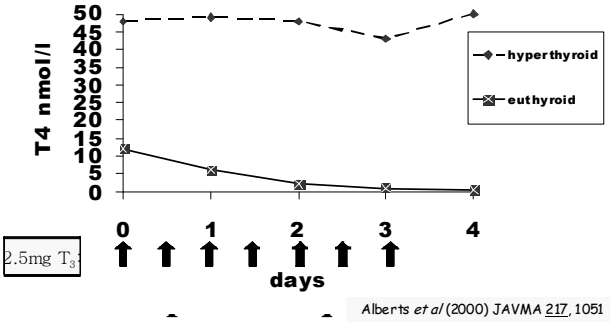
Interpretation

T3 is normally seen to peak approx. 2 hrs following TRH at typically 2-5 x baseline. T4 peaks later at approx. 4 hrs and generally has a lower peak of 1½-3 x baseline. Responses to TRH comprising a less than 50% increase in either hormone would be consistent with hypothyroidism but would not differentiate pituitary from thyroid disease. Although hypothyroidism is reported in horses it is extremely rare.



T3 suppression test

Similarly hyperthyroidism is a very rare condition although a couple of reports exist of endocrinologically active thyroid tumours. Hyperthyroidism is best diagnosed by using a T3 suppression test. The procedure involves injection of 2.5 mg of exogenous T3 at 8.30 a.m. and 6 p.m. for 7 doses with T4 being measured at 8.30 a.m. every day for 4 days during the administration. Normal horses are expected to show a progressive depression of T4 following negative feedback of the exogenous T3, however an autonomously active hyperthyroid gland will continue to produce high levels of T4 irrespective of the exogenous T3 administered.



Alberts *et al* (2000) JAVMA 217, 1051