Thyroid Diseases in Pets

Most common hormonal diseases in dogs and cats

Thyroid hormones maintain or promote the basal metabolism in cells throughout the body. Thyroid hormone deficiency or Hypothyroidism is common in dogs. While excess of thyroid hormones or Hyperthyroidism is common in cats.

The hypothalamus secretes thyrotropin-releasing hormone (TRH) to stimulate the pituitary gland. The amount of TRH depends on the amount of T3 and T4 secreted in the negative feedback. The pituitary gland secretes thyroid stimulating hormone (TSH) to stimulate the thyroid gland. The thyroid gland then secretes thyroid hormones T3 and T4.

Most of the hypothyroidism in dogs are caused by the malfunction of the thyroid gland itself. This can be by lymphocytic thyroiditis or episodic thyroid atrophy or tumor. In this case, T4 is low and the TSH is high.

Hyperthyroidism which commonly occurs in cats are caused by hyperplasia or enlargement of the thyroid gland. TSH is inhibited and levels drop due to the excessive T4 secreted.

Canine Hypothyroidism
apathy
hypoactivity
tendency for obesity
skin symptoms
nonregenerative anemia
hyperlipidemia

Feline Hyperthyroidism
restlessness
increased appetite
weight loss
excessive urine secretion
excessive thirst
increased ALP and GPT
Not all low T4 are Hypothyroidism.

Despite normal thyroid function, thyroid hormones may decrease. This is caused by the decreased metabolism in response to serious or chronic systemic disease. This is called Euthyroid sick syndrome. Euthyroid sick syndrome patients have low T4 despite normal thyroid function. It exhibits decreased or normal TSH levels. Sometimes, it is slightly elevated but not as high as hypothyroidism.

It is highly recommended to test T4 with T4 during screening for Hypothyroidism in dogs to prevent misdiagnosis of the above cases.

Examples of a diagnostic flow for hypothyroidism and hyperthyroidism are shown below. The British Small Animal Veterinary Association (BSAVA) recommends testing both T4 and TSH when there are symptoms of thyroid disease in dogs.

**First-line testing for canine hypothyroidism**

- T4 low
  - TSH normal: Non-thyroidal illness
  - Drug therapy 25% of hypothyroid dogs
  - TSH increased: Hypothyroidism
- T4 normal
  - TSH normal: Euthyroidism
  - TSH increased: Compensating hypothyroidism

Recent withdrawal from thyroid suppressive medication
Recovery from NTI*: T4 autoantibody interference

This flowchart is based on BSAVA Manual of Canine and Feline Endocrinology Fourth Edition.

* NTI: Non-Thyroidal Illness

Hyperthyroidism in cats is generally diagnosed by the T4 level and clinical symptoms.

**First-line testing for feline hyperthyroidism**

- T4 normal: Hyperthyroidism Negative
- T4 increased: Hyperthyroidism Positive

**FUJI DRI-CHEM AU10V, v-T4 and vc-TSH**

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<thead>
<tr>
<th>Product Name</th>
<th>FUJIFILM article code</th>
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<td>FUJI DRI-CHEM IMMUNO AU10V vc-TSH</td>
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- Measurement time: 10 min
- Types of sample: v-T4: Canine and Feline Plasma/Serum  
v-TSH: Canine Plasma/Serum
- Sample volume: 100µL/ test
- Dynamic Range: v-T4: 0.30 - 8.00 µg/dL (6.4 - 103.0 nmol/L)  
v-TSH: 0.25 - 5.00 ng/mL
- Reference Interval: v-T4 can be: 1.3 - 2.9 µg/dL (16.7 - 37.3 nmol/L)  
v-T4 feline: 0.9 - 3.7 µg/dL (11.6 - 47.6 nmol/L)  
v-TSH: <0.50 ng/mL
- Reagent Storage: 2 - 8°C

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