



AHDC Endocrinology Laboratory

INTERPRETATION OF THYROID TESTING

The following table contains possible interpretations of various thyroid states for dogs, cats, and horses.

Canine: Measurement of free-T4 may be useful in differentiating dogs with true hypothyroidism from dogs with reduced thyroid function due to other chronic illness (e.g., hyperadrenocorticism, liver disease, diabetes), drug administration (e.g., glucocorticoids), and malnutrition. TSH is normal in many abnormal dogs, so we recommend measuring it in combination with other thyroid function tests. Thyroglobulin autoantibody (TgA) testing is recommended for dogs with a breed predilection for autoantibody problems or those with unexpectedly high T3 or T4 values.

Feline: The free-T4 test may be a useful additional test in cats that are clinically hyperthyroid, but have normal total T3 and/or total T4 concentrations. Cats with a low total protein due to liver or kidney disease may have falsely elevated free T4 levels.

Equine: Horses seldom have primary hypothyroidism, but often have hypothyroidism secondary to equine metabolic syndrome (EMS) or pituitary pars intermedia dysfunction (PPID, Cushing’s syndrome). A few true hyperthyroid horses have been documented. Supplements high in iodine or containing kelp may cause high thyroid levels and occasionally signs of hyperthyroidism.

Anti-inflammatories, steroids, chronic illness, dietary supplements, and a variety of other factors may affect thyroid function. Taking into consideration the animal's history and results of the physical examination and other laboratory tests, possible interpretations are as follows.

TOTAL T4	TOTAL T3	FREE-T4 ^{3,4}	TSH ¹	POSSIBLE INTERPRETATION
low	low	low	normal/high	primary hypothyroid
low	normal/low	normal/high	normal	sick euthyroid
low	normal/high	low	normal	primary hypothyroid (early stage)
low	high	low	normal/high	T3 autoantibody & hypothyroid
low	normal/low	low	normal	secondary hypothyroidism
normal	normal	normal	normal	euthyroid
normal	low	normal	normal/high	euthyroid
normal	normal	low	normal/high	not diagnostic for hypothyroidism
high	normal/low	high	normal	T4 autoantibody/T4 supplementation
high	normal/low	low	normal/high	T4 autoantibody & hypothyroid
high	high	high	normal	functional thyroid tumor
high	high	low	normal/high	T3 & T4 autoantibody; hypothyroid

Special consideration:

- 1) TSH testing is available only for dogs and cats.
- 2) TgA (thyroglobulin autoantibody) testing is only available for dogs.
- 3) Free T4 is available by Immulite or by equilibrium dialysis for dogs. TgA positive dogs may have falsely elevated Free T4 Immulite results, so should always be tested using the free T4 by dialysis method available for other species.
- 4) Free T4 by equilibrium dialysis is the only Free T4 test method we use for cats and horses.