
Abstract
Thyroxine (T₄), 3,5,3'-triiodothyronine (T₃), and cortisol frequently are quantified in canine serum or plasma samples to aid in the diagnosis of hypothyroidism, hypoadrenocorticism, and hyperadrenocorticism. Many laboratories have established reliable reference values for concentrations of these hormones in blood of clinically normal animals. However, nonpathologic factors that affect thyroidal and adrenocortical secretion may lead to misinterpretation of test results when values for individuals are compared to reference values. The objective of the study reported here was to identify effects of age, sex, and body size (ie, breed) on serum concentrations of T₃, T₄, and cortisol in dogs.

Blood samples were collected from 1,074 healthy dogs, and serum concentrations of the iodothyronines and cortisol were evaluated for effects of breed/size, sex, and age. Mean (± SEM) serum concentration of T₄ was greater in small (2.45 ± 0.06 µg/dl)- than in medium (1.94 ± 0.04 µg/dl)- or large (2.03 ± 0.03 µg/dl)-breed dogs, the same in females (2.11 ± 0.04 µg/dl) and males (2.08 ± 0.04 µg/dl), and greater in nursing pups (3.04 ± 0.05 µg/dl) than in weanling pups (1.94 ± 0.05 µg/dl), rapidly growing dogs (1.95 ± 0.04 µg/dl), and young adult (1.90 ± 0.06 µg/dl), middle-aged adult (1.72 ± 0.05 µg/dl) or old adult (1.50 ± 0.05 µg/dl) dogs. Dogs > 6 years old had lower mean serum T₄ concentration than did dogs of all other ages, except middle-aged adults. Mean serum T₃ concentration in medium-sized dogs (1.00 ± 0.01 ng/ml) was greater than that in small (0.90 ± 0.01 ng/ml)- and large (0.88 ± 0.01 ng/ml)-breed dogs. Serum T₃ concentration was lowest in nursing (0.85 ± 0.01 ng/ml) and weanling (0.77 ± 0.02 ng/ml) pups, increased in rapidly growing dogs (0.99 ± 0.01 ng/ml) and young adult dogs (1.10 ± 0.04 ng/ml), and decreased slightly in middle-aged (0.98 ± 0.02 ng/ml) and old (1.01 ± 0.03 ng/ml) adult dogs. Serum T₃ concentration was unaffected by sex. Mean serum cortisol concentration was greater in small (1.06 ± 0.07 µg/dl)- than in large (0.79. ± 0.03 µg/dl)-breed dogs. Serum from nursing pups (0.57 ± 0.04 µg/dl) contained less cortisol than did serum from older dogs (mean values ≥ 0.92 µg/dl). Serum cortisol concentration was not different between males and females. These effects of breed/size and age on serum T₃, T₄, and cortisol concentrations should be considered when evaluating thyroid and adrenocortical functions in dogs.