



ISWAVLD 2023

International Symposium of the World
Association of Veterinary Laboratory
Diagnosticians

29 JUNE-1 JULY
2023
Congress Centre
Lyon

*Towards
the veterinary
diagnostics
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Main topic : Toxicology in animal health and environment

Presumptive raw food-associated thyrotoxicosis in 2 dogs

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Introduction: Two dogs from independent owners presented to a Veterinarian in Ontario, Canada, with a history of weight loss, PU/PD, anxiety and diarrhea. The dogs had been fed a raw food diet supplied for several years by the same local manufacturer. Laboratory testing revealed elevated concentrations of thyroid hormones in serum, and a clinical diagnosis of hyperthyroidism was made. Hyperthyroidism is uncommon in dogs, most frequently associated with thyroid hormone-secreting neoplasms; however, there was no clinical evidence of thyroid neoplasia in these patients. Since animal parts containing thyroid tissue may be used as ingredients in raw food diets, thyrotoxicosis was suspected. In order to investigate this hypothesis, food samples were tested for total iodine. To determine if dietary iodine levels were due to incorporation of thyroid gland tissue in the ingredients (as opposed to another source of iodine; e.g. inorganic), the samples were also tested for the presence of thyroid hormones.

Methods: food samples were submitted to the toxicology and clinical pathology sections of the Animal Health Laboratory, University of Guelph, for quantification of total iodine and determination of free thyroxine (fT₄). The samples for total iodine were extracted with tetramethylammonium hydroxide and analyzed by ICP-MS. The samples for fT₄ were extracted in ethanol and analyzed by radioimmunoassay after equilibrium dialysis.

Results: total iodine levels in the raw foods (as high as 20.5 mg/kg wet weight) were higher than the maximum levels suggested to be safe for dogs by the regulatory authorities (11 mg/kg [AAFCO]; 4 mg/kg [EFSA]). The results of the fT₄ analyzes mimicked those of the iodine levels.

Conclusions: raw food-associated thyrotoxicosis should be suspected in dogs presenting with clinical signs of hyperthyroidism in the absence of thyroid neoplasia. Suspicious foods may be screened by quantification of total iodine content by ICP-MS, and by determination of thyroid hormones in ethanol extracts. The clinical signs of these dogs rapidly improved after transitioning to dry food, indicating this condition is dose-dependent and reversible.