



# Letters & Notices

## CANINE HEALTH

### Possible diet-related increase in copper-associated liver disease in dogs

WE write as members of the American College of Veterinary Internal Medicine (ACVIM) consensus group on canine chronic hepatitis<sup>1</sup> to alert practitioners, veterinary pathologists and the pet food industry to our concern that the safe upper limits for dietary copper in dog foods are too high for many dogs.

Among our group, each of us has independently recognised an increased prevalence of copper-associated hepatopathy (CuAH) in pure- and mixed-breed dogs coinciding with the modification of copper supplements used in commercial dog foods. Changes were made based on a small study in 1993 conducted in purpose-bred beagles;<sup>2</sup> this study was never published in peer-reviewed form. We have published a commentary giving more details of our concerns.<sup>3</sup>

The severity of CuAH varies at initial diagnosis from minor injury associated only with increased alanine aminotransferase (ALT) activity without significant liver damage, to end-stage liver disease (ie, cirrhosis).

Diagnosis of CuAH is achieved by recognition of a persistent unexplained two- to three-fold increase in ALT activity and liver biopsy with confirmation of hepatocyte copper accumulation using copper-specific stains or quantitation.

Treatment is expensive and includes oral administration of a copper chelator or zinc, antioxidants and pyridoxine supplementation and lifelong feeding of a copper-restricted diet. Management for this chronic condition requires diligent owner commitment.

We are concerned that the potential for CuAH is often not considered beyond high-risk breeds (Bedlington terriers, Labrador retrievers, dobermanns and Dalmatians).

“**[We have a] concern that the safe upper limits for dietary copper in dog foods are too high for many dogs**”



Non-predisposed breeds are affected in the USA<sup>4</sup> and one of us (PJW) has recently recognised CuAH in Cavalier King Charles spaniels and other atypical breeds in the UK.

Furthermore, hepatic copper accumulation is sometimes misinterpreted as a phenomenon secondary to a primary liver disorder or cholestasis. But we dispute this pathogenesis in dogs.<sup>5</sup>

There is strong case-based evidence that current dietary copper allowances for canine diets have caused increased hepatic copper concentrations in pet dogs of mixed or pure breed ancestry. This concern has been amply documented in peer-reviewed veterinary literature.<sup>3</sup>

We wish to increase awareness to facilitate early diagnosis and treatment of canine CuAH. We request that veterinarians and owners report dogs with histologically confirmed CuAH to Penny Watson, at the details below, who will collate data on breed and diets fed to inform future work.

This is not a criticism of the pet food industry but rather a call for further work to provide evidence to allow regulatory bodies to take corrective action.

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#### References

- 1 Webster CRL, Center SA, Cullen JM, *et al*. ACVIM consensus statement on the diagnosis and treatment of chronic hepatitis in dogs. *J Vet Intern Med* 2019;33:1173–200
- 2 Czarnecki-Maulden G, Rudnick R, Chausow D. Copper bioavailability and requirement in the dog: comparison of copper oxide and copper sulfate (abstract). *FASEB J* 1993;7:A305
- 3 Center SA, Richter KP, Twedt DC, *et al*. Is it time to reconsider current guidelines for copper content in commercial dog foods? *J Am Vet Med Assoc* 2021;258:357–64
- 4 Strickland JM, Buchweitz JP, Smedley RC, *et al*. Hepatic copper concentrations in 546 dogs (1982–2015). *J Vet Intern Med* 2018;32:1943–50
- 5 Azumi N. Copper and liver injury – experimental studies on the dogs with biliary obstruction and copper loading. *Hokkaido Journal of Medical Science* 1982;57:331–49

## DEER WELFARE

### Darting of wild and park deer

WE are concerned that when wild deer need to be darted, including deer in deer parks, colleagues may inadvertently be acting unlawfully. Correspondence and discussion with the RCVS have confirmed that: