

# FEED-RELATED HYPERVITAMINOSIS D IN A CAPTIVE FLOCK OF BUDGERIGARS (*MELOPSITTACUS UNDULATUS*): MORBIDITY, MORTALITIES AND PATHOLOGIC LESIONS

*June E. Olds, DVM,<sup>1,2\*</sup> Steve Ensley DVM, PhD,<sup>3</sup> Ronald Horst PhD,<sup>4</sup> Eric Burrough DVM, PhD, DACVP,<sup>3</sup> Darin Madson, DVM, PhD, DACVP,<sup>3</sup> Kent Schwartz DVM, MS,<sup>3</sup> Gregory W. Stevenson, DVM, PhD, DACVP,<sup>3</sup> Phillip Gauger DVM,<sup>3</sup> Bruce H. Janke DVM, PhD,<sup>3</sup> Vicki L. Cooper DVM, MS, PhD,<sup>3</sup> Paulo Arruda DVM, MS,<sup>3</sup> and Tanja Opriessnig, dr med vet, PhD<sup>3</sup>*

<sup>1</sup>*Department of Veterinary Clinical Sciences, Iowa State University College of Veterinary Medicine, Ames, IA 50010;* <sup>2</sup>*Blank Park Zoo, Des Moines, IA 50315;* <sup>3</sup>*Veterinary Diagnostic Laboratory, Iowa State University College of Veterinary Medicine, Ames, IA 50010;* <sup>4</sup>*Heartland Assays, Ames, IA 50010*

## Abstract

In the spring of 2012, the Blank Park Zoo began suffering mortalities in a flock of 229 captive Budgerigars (*Melopsittacus undulatus*) housed in an interactive public-feeding aviary. Clinical signs included weakness, posterior paresis, inability to fly, central nervous signs or acute death. Gross and microscopic lesions were not apparent in acutely affected deceased birds. Many birds had evidence of trauma, but these traumatic events are now hypothesized to have been related to the birds' weakness. Investigation into the cause(s) of morbidity and mortality were complicated by the recent opening of the new interactive enclosure, so environmental and husbandry sources were heavily scrutinized. Later in the course of the investigation, microscopic examination of tissues revealed mineralization of soft tissues consistent with hypervitaminosis D.<sup>1-5</sup> Serum analysis of deceased birds also identified elevated vitamin D<sub>3</sub> levels. Analysis of the formulated diet detected elevated levels of vitamin D<sub>3</sub> 22.5-times the manufacturer's labeled content in the formulated feed (label = 1800 IU/kg, actual = 40,520 IU/kg). These findings eventually led to the manufacturer's recall of over 100 diets fed to a wide variety of domestic and captive wild animals in the United States and internationally. This case report highlights the complexities of determining the etiology of a toxic event in a zoological institution.

## Literature cited

1. Baker, J. 1990. Dangers in Vitamin Overdose. *Cage Aviary Birds*, March 31 (1990): pp 5-6.
2. Bauck, L. 1995. Nutritional Problems in Pet Birds. *Seminars in Avian and Exotic Pet Medicine*, W.B. Saunders Co., Vol 4, No 1 (January): 3-8.
3. Cheville, N.F. 1999. *Introduction to Veterinary Pathology*. Second Edition. Iowa State University Press, Ames, IA 50014: 42-44
4. Lightfoot, T.L and J.M. Yeager. 2008. Pet Bird Toxicity and Related Environmental Concerns, *Veterinary Clinics of North America: Exotic Animal Practice*, Volume 11, Issue 2, May 2008, Pages 229-259, ISSN 1094-9194, 1016/j.cvex.2008.01.006.
5. Thomson, R. G., Thomson's special *Veterinary Pathology*. (ed. by) M. D. McGavin, W.W. Carlton, J.F. Zachary. 3<sup>rd</sup> Edition. 2001. Mosby, Inc.