Evaluation of the Pre-Analytical Stability of Adrenocorticotropic Hormone in Plasma and Whole Blood From Horses

James Prutton, BSc(Hons), BVSc, MRCVS*; Philip H. Kass, BS, DVM, MPVM, MS, PhD; Joie Watson, DVM, PhD; and Nicola Pusterla, DVM, PhD, Diplomate ACVIM

Adrenocorticotropic hormone (ACTH) measurements from the equine patient are stable until 24 hours in samples stored at 21°C or 4°C, whereas storage as whole blood or plasma has no effect. Freezing samples maintains adrenocorticotropic hormone levels for at least 30 days. Authors’ addresses: The William R. Pritchard Veterinary Medical Teaching Hospital and the Department of Medicine and Epidemiology (Prutton, Pusterla, Watson) and Department of Population Health and Reproduction (Kass), School of Veterinary Medicine, University of California, Davis, CA 95616; e-mail: j-prutton@hotmail.com. *Corresponding and presenting author. © 2013 AAEP.

1. Introduction
Equine pituitary pars intermedia dysfunction is a disease of aged horses that is most easily diagnosed through the use of an endogenous adrenocorticotropic hormone (ACTH) blood sample. The stability of ACTH in a collected blood sample has not been fully elucidated, and the goal of the study was to address this.

2. Materials and Methods
Eleven horses were blood-sampled, and ACTH levels were assessed after storage at 4°C, 21°C, −20°C, and −80°C for up to 30 days either as whole blood or plasma.

3. Results
Detection of ACTH was similar between whole blood and plasma. Time affected ACTH levels, with storage beyond 24 hours dramatically reducing ACTH recovery. Freezing at both −20°C and −80°C did not depreciate ACTH levels.

4. Discussion
ACTH measurements in the equine patient were subject to degradation, but appreciable changes were only seen at 48 hours and longer in samples stored at 21°C or 4°C, whereas storage as whole blood or plasma had no effect. Freezing samples maintained ACTH levels for at least 30 days. This information allows practitioners to reasonably store samples without centrifugation for at least 24 hours and appears to negate the need for protease inhibitors in the samples.