Endogenous Steroid Profiling of Young Thoroughbred Horses in Athletic Training

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The purpose of this study was to determine reference ranges for androgen production in young Thoroughbred horses. Authors' addresses: K.L. Maddy Equine Analytical Chemistry Laboratory, California Animal Health and Food Safety Laboratory, School of Veterinary Medicine, University of California, Davis, California 95616 (Moeller, Stanley); Hagyard Equine Medical Institute, 4250 Iron Works Pike, Lexington, Kentucky 40511 (Brown); Rood & Riddle Equine Hospital, PO Box 12070, Lexington, Kentucky 40580 (Pierce); and PO Box 12310, Lexington, Kentucky 40582 (Van Balen); e-mail: bcmoeller@ucdavis.edu (Moeller). © 2009 AAEP.

1. Introduction
The abuse of anabolic androgenic steroids (AAS) in young horses raises several ethical concerns. A small number of horses randomly tested from sales events in the fall of 2007 were found to have detectable amounts of synthetic AAS (stanozolol) and endogenous AAS (testosterone). To properly address the potential abuse of AAS in young developing horses, reference values need to be established for the monitoring of endogenous production of progestins, estrogens, androgens, and their metabolites.

2. Materials and Methods
Two hundred eight non-treated Thoroughbred horses (153 colts and 55 fillies), between the ages of 5 and 11 mo, that were in athletic training in Kentucky were enrolled in the study. Monthly serum samples were collected over a 13-mo period (from November 2007 to December 2008). Serum levels of 33 endogenous steroids were quantitatively measured using liquid chromatography tandem mass spectrometry.

3. Results and Discussion
The production of androgens in colts increased with age and lengthening of the photoperiod, and the average maximum production occurred during the month of April. Testosterone and androstenedione were the most commonly detected androgens at concentrations of >125 pg/ml. Low amounts of nandrolone and metabolites including 5α-estrans-3β,17a-diol were also detected.