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Entitled

LEVELS OF TESTOSTERONE METABOLITES IN CAMEL HAIR

by

Aysha Khalid Ali Abdulla Alraeesi

Faculty Advisor

Dr. Iltaf Shah, Department of Chemistry

College of Science

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Abstract

Introduction: - Doping and steroid use is a serious threat to the animals' health and can even lead to their untimely and painful death. But doping is an acute problem in today's animal racing world especially camel racing. Testosterone and its 10 metabolites Benzoate, Valurate, Isocupruate, Hexahydrobenzoate, Decanuate, Undecanovate, Laurate, Enanthate, Cypionate, Capurate are of utmost importance because it these are endogenously produced in animals and difficult to measure. Along with other animals, the testosterone and its metabolites levels in camel are usually determined using urine and blood tests. The aim of this study was to develop and validate a liquid chromatographic-mass spectrometric method (LC-MS/MS) method to determine testosterone metabolites in camel hair and to use the validated method to determine testosterone metabolites in camel hair samples collected. To our knowledge, this is the first time this research has been reported.

Methods: - Camel hair samples were collected from 21 non-racing dromedary camels along with 3 racing camels in Al Ain, UAE and were decontaminated, pulverised, sonicated, and extracted prior to analysis. An LC-MS/MS method was employed to determine the levels of testosterone metabolites in camel hair.

Results and discussion: - Testosterone and its 10 metabolites along with cortisol-D4 internal standard were optimised for LCMS/MS analysis but only 8 metabolites, namely Testosterone, Benzoate, Valurate, Isocupruate, Hexahydrobenzoate, Decanuate, Undecanovate and Laurate could be validated in camel hair. Only 5 metabolites of testosterone could be determined in camel hair samples with concentrations ranging between 10.5-14.9 pg/mg for Valurate (in 3 camels), 12.5-151.6 pg/mg for Hexahydrobenzoate (in 6 camels), 4.8- 32.1 pg/mg for Laurate (in 5 camels), Decanovate 5.1 pg/mg (in one camel), and 8.35-169.6 pg/mg for testosterone was found in all 24 camels. It was interesting to note that the 3 racing camels displayed high concentrations of testosterone (59.2-169.6 pg/mg, all 3 camels), laurate (4.8-14.5 pg/mg, 2 camels), Hexahydrobenzoate (116.25 pg/mg, 1 camel), Decanovate (5.1 pg/mg, 1 camel) and valurate (11.7 pg/mg, 1 camel).

Conclusion: This novel camel hair test is Accurate, sensitive, rapid, and robust. The findings reported in this study could be of importance when evaluating racing camels for suspected doping offenses or for injury and disease control. Further testosterone supplementation controlled studies are required to evaluate individual metabolites' effects on camel health and diseases and performance enhancement levels. This new hair test could help further studies in doping control, toxicological studies, pharmacological studies and other clinical applications in camel health, injury, and disease.

Keywords: Camel hair, Testosterone metabolites, Doping, LCMS/MS