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THE EFFECT OF DIETARY CADMIUM ON KIDNEY FUNCTION IN CATS

A thesis presented in partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE

in

Animal Science

at Massey University

Palmerston North, New Zealand

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2017

Abstract

Due to the requirement for meat in feline diets, this study aimed to investigate the potential effects on kidney function in cats of cadmium accumulation in meat products due to pasture management practices. Cadmium may be a causal factor in feline Chronic Kidney Disease (CKD). Twenty-seven domestic short hair cats were randomly selected from the colony population of the Feline Nutrition Unit of Massey University and assigned to three experimental groups (n=9), which were balanced for age and sex. Each group received one of the three experimental diets designed to represent the full range of potential cadmium concentrations that cats may be exposed to on wet diets in New Zealand. Diets were fed *ad libitum* for a 6-month period. Kidney function was examined at baseline and after 3 and 6 months by measuring glomerular filtration rate (GFR) using iohexol clearance analysed by high performance liquid chromatography (HPLC). Blood and urine analyses were also conducted on a monthly basis. While GFR fluctuated over the study period no significant differences were found either between groups at the end, or within each group when compared at the beginning and end of the study. Although overall no evidence of CKD was observed, an unexplained trend of weight loss was observed in females receiving the two diets containing the highest cadmium levels, which may simply have reflected reduced dietary palatability. The results of the study showed no detectable effects of feeding the three diets for 6 months; however, an extended trial period may be required to fully investigate the longer term effects of cadmium levels and other dietary factors on the development of CKD. In particular, more work is needed to explore the potential for genetic and/or functional differences in mechanisms which are involved in the transport, and/or deposition of cadmium, or are protective against cadmium toxicity in cats and to further define normal parameters and standard approaches in measuring GFR in cats.

Acknowledgements

I would like to thank my supervisors David Thomas and Kay Rutherford-Markwick for giving me the opportunity to undertake this project.

I would also like to thank the experts who were involved in the set-up of the study; Nick Cave for the initial diet analysis, and Annalee O'Rourke at Heinz Wattie's for manufacturing the experimental diets.

I would also like to acknowledge the assistance of Centre for Feline Nutrition Staff with the blood and urine sampling and feeding of experimental diets, and Sherina Holland for her assistance with the HPLC analysis.

Lastly I would like to say a big thank you to friends, particularly Malcolm, and family for their support and advice. This accomplishment would not have been possible without them.

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List of Abbreviations

BW	Body Weight
CBC	Complete Blood Count
Cd	Cadmium
CKD	Chronic Kidney Disease
DM	Dry Matter
GFR	Glomerular Filtration Rate
HPLC	High Performance Liquid Chromatography
HR	Heart Rate
IRIS	International Renal Interest Society
MT	Metallothionein
PTWI	Provisional Tolerable Weekly Intake
SBP	Systolic Blood Pressure
USG	Urine Specific Gravity

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