



## Thesis abstract

# Diet, Nutrition and Haematology of Dasyurid Marsupials

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Abstract of a thesis for a Doctorate of Philosophy submitted to the University of Western Sydney,  
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Stannard's PhD thesis examined diet, nutrition and haematology of six dasyurid species, which are a family of insectivorous and/or carnivorous Australian marsupials. Diet and nutrition were studied to obtain information on diet choice by translocated animals and food digestibility in captive animals. Haematology was studied in captivity as it is associated with clinical health and influenced by nutrition. The broad aim of the study was to aid current wildlife management practices and future conservation efforts (such as reintroduction and translocation programs) for these six species and other marsupial species in Australia.

Examination of the diet of a population of translocated red-tailed phascogales (*Phascogale calura*) at Alice Springs Desert Park confirmed that they are primarily insectivorous. They are also opportunistic predators within the park, consuming birds, small mammals, and on occasion reptiles and plant material.

Study of nutrition in red-tailed phascogales and kultarrs showed apparent digestibility values were above 81% for dry matter, energy, protein and lipids on a number of

captive fed diets. Maintenance energy requirements were determined for the red-tailed phascogale (954 kJ kg<sup>0.75</sup> d<sup>-1</sup>), kultarr (*Antechinomys laniger*) (695 kJ kg<sup>0.75</sup> d<sup>-1</sup>), stripe-faced dunnart (*Sminthopsis macroura*) (359 kJ kg<sup>-0.75</sup> d<sup>-1</sup>) and fat-tailed dunnart (*Sminthopsis crassicaudata*) (542 kJ kg<sup>-0.75</sup> d<sup>-1</sup>). The morphology of the gastrointestinal tract of both dunnart species and the kultarr were simple and consisted of a unilocular stomach and relatively uniform intestine. Digestibility studies in a larger dasyurid species, the eastern quoll, showed they had high apparent digestibility values for dry matter, gross energy, protein and lipids (>84%). There was a significant difference in apparent digestibility of dry matter, gross energy and protein between the two diets provided, kangaroo mince and chicken necks.

Analysis of blood parameters in the eastern (*Dasyurus viverrinus*) and spotted-tailed quoll (*Dasyurus maculatus*) provided new data for blood chemistry and differential white cell values. Seasonal differences were determined for total bilirubin, glucose, creatinine and sodium levels. Eastern quolls one year of age and under had significantly higher alkaline phosphatase values than older animals.

The results from this thesis have implications for captive management and future conservation efforts for Dasyurids. The study has shown the diet choice of translocated phascogales in a new environment, which has contributed to improving translocation techniques used for this species. Nutritional experiments suggest that no single diet, if fed alone is appropriate for feeding captive dasyurids; and live insect diets provide behavioural enrichment, and enhance mental and physical stimulation. The ability of captive animals to catch live food also increases the likelihood of their survival post-release, if they are subject to translocation in the future. Energy requirements differ between species and do not necessarily relate to body mass but likely relate to physiological adaptations and species

ecology. The blood levels determined in this study can be used to assess clinical health of quolls and assist with captive management and future reintroduction programs. The data gained in this study has been incorporated into the daily management/husbandry practices for these species.

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