Nutritional status and growth of Impala (*Aepyceros melampus*) in the Limpopo Province

by

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Submitted in fulfilment of the requirements for the degree
Magister Scientiae Agriculturae

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Pretoria

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2002

DECLARATION

I declare that the dissertation hereby submitted for the degree Magister Scientiae Agriculturae at University of Pretoria is my own work and has not been submitted before at another university or faculty. I further cede copyright of this dissertation in favour of the University of Pretoria.

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ACKNOWLEDGEMENTS

I would thank my parents for affording me the opportunity to further my studies, without their support it would not have been possible. To Professor Eddie Webb and Professor Van Ryssen, thank you for you patience and guidance throughout the duration of the preparation of this dissertation. A special thank you to Elise Ferreira and Truidia Smit for their assistance in the analyses at the Animal Science Laboratory. I would also like to thank Professor Groenewald and Rina Owen from the Statistics Department at the University of Pretoria for their statistical advice. To Tippy, Belinda, Fred and Hannes at Ndzalama and Selati Game Reserves, your accommodation and help in the collection of the data was appreciated. To all the staff at Mara Research Farm, the students from the Van Hall Institute, Holland thank you as well for all your assistance. Finally I would like to thank Steve for his time and motivation whilst I was preparing this dissertation.

ABSTRACT

Nutritional status and growth of Impala (*Aepyceros Melampus*) in the Limpopo Province

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Man has used game meat obtained from the cropping of wild populations for many years. The impala (*Aepyseros melampus)* is numerically the most important single species (Fairall, 1983) available for game farming in the Lowveld and the bushveld areas of the Limpopo Province, Mpumalanga and KwaZulu - Natal. Wildlife nutrition has an important effect on the growth and successful production of offspring in animal populations. Knowledge of wildlife nutrition is, therefore, an important facet of game ranch management. A number of studies were conducted over the past two decades to determine the forage intake and nutritional status of herbivores.

The aim of this research project was to study the nutritional status and growth of impala in three areas in the Limpopo Province. The following areas were investigated namely Gravellotte, Bandolierskop and Louis Trichardt. The study was conducted between January 2000 and December 2002.

ABSTRACT

Samples of the vegetation, soil, liver and blood from impalas as well as water samples were collected from each of the farms. The blood and liver samples were taken from culled impala every two months. Linear measurements were taken on all the culled animals. Mineral and pathological analyses were done on the liver samples. The vegetation and soil samples were collected from each farm during the wet season and mineral analyses were done on the samples. The blood samples were used for DNA analysis to determine genetic variation within impala populations at each of the farms.

The graze present at the respective game farms showed no difference in nutrient quality. The phosphorus (P) concentration of browse was significantly lower at Ndzalama and Selati (Lukhele & Van Ryssen, 2000.). Soil samples collected at Ndzalama showed lower P levels than Selati and Mara. This lower concentration of P in the soil as well as the browse could play a role in the reduced growth of the impala at the game farms in the Gravellotte area. Multivariate analysis on the liver samples showed significant differences between the animals at Mara and those on the two Lowveld farms. The copper (Cu) concentrations were significantly lower at Ndzalama than Mara ($P=0.03$), while the selenium (Se) concentrations at both Ndzalama and Selati were significantly lower than those concentrations at Mara ($P=0.001$). The liver concentration of Se suggests a Se deficiency at the Lowveld farms.

ABSTRACT

The faecal P concentrations at Mara, Selati and Ndzalama were 2.22, 1.39 and 2.12 g P/kg organic matter (OM) respectively. The faecal nitrogen (N) for Mara, Selati and Ndzalama were 18.53, 18.19 and 17.97 g N/kg OM respectively.

Pathology results from the Onderstepoort pathology laboratory showed severe infection with *Paracooperioides peleae* (Nematoda: *Trichostrongylidae*), bankrupt worm, which is a fairly common parasite in antelope. Liver fluke, *Cooperia hepatica,* was also present in moderate to severe infestations in the liver samples from Ndzalama. Samples from Mara showed little or no parasitic infection. It was suggested that due to the severe parasitic infection, the live mass and empty body mass of the impala were lower at Ndzalama and Selati compared with those samples at Mara. Linear measurements did not differ between the areas.

Initial DNA analyses suggest very little genetic variation among impala on all three farms sampled and, therefore, it is advisable to introduce impala from Mara or another farm in the Louis Trichardt area to increase the genetic variation at Ndzalama and Selati.

Supplementation in the form of a mineral lick can be provided to the impala. An effort should be made to move the cattle at the BVB Ranch at Selati, which roam freely with the impala, to alleviate the severe parasitic infection present. This aspect requires further research.

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