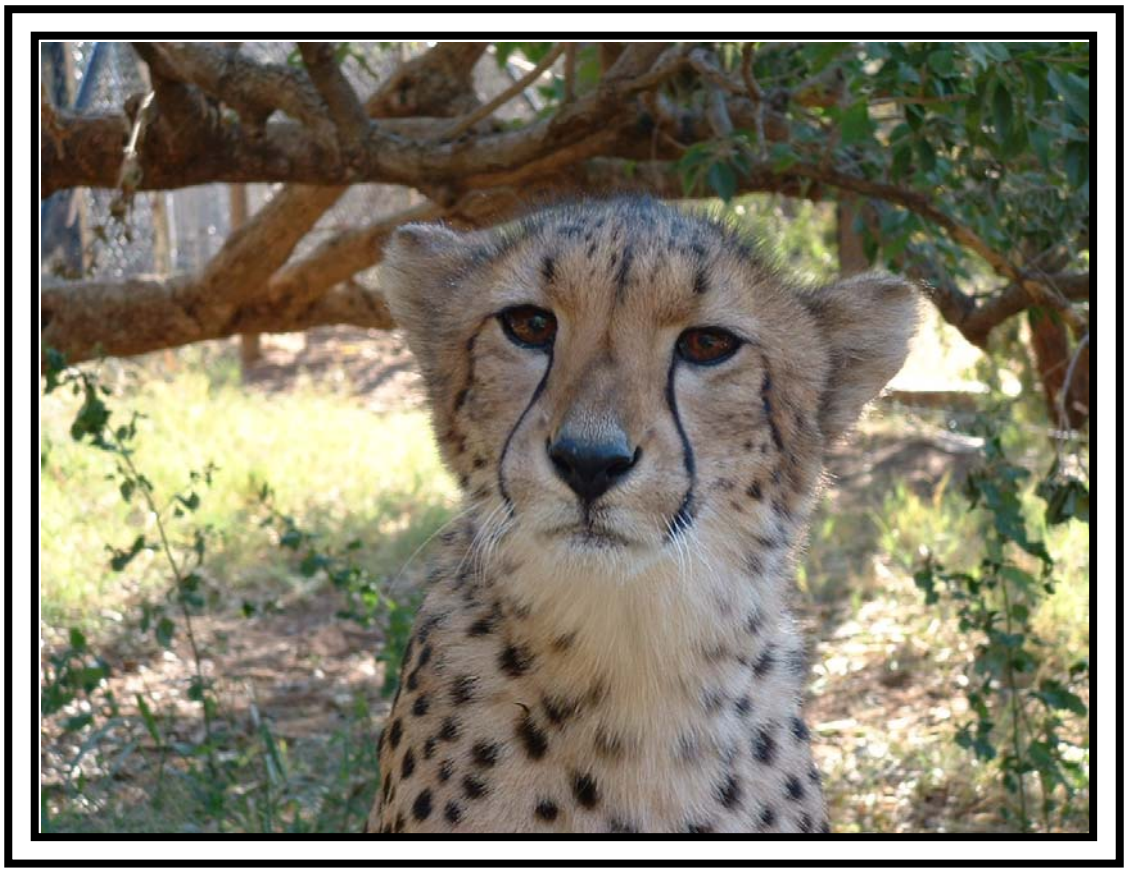
THE USE OF A PROBIOTIC IN CAPTIVE CHEETAHS (*Acinonyx jubatus*)

by

Katja Natalie Koeppel



Submitted in partial fulfilment of the requirements for the degree of Master of Science (MSc) in the Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, South Africa

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Abstract

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Supervisor : Professor Moritz van Vuuren
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The project was undertaken to establish the normal intestinal flora of healthy cheetahs and to produce a species-specific probiotic for use in juvenile cheetahs in captivity to improve weight gain and reduce diarrhoea.

The normal intestinal flora of healthy cheetahs was established using non-selective and selective media. High numbers of anaerobic bacteria and aerobic bacteria were isolated from the faeces of cheetahs in this study. Eight percent of isolates were *Enterococcus* spp. Both *Enterococcus faecium* and *Lactobacillus* Group 1 were selected for use in the probiotic.

Twenty-seven juvenile cheetahs between eight and thirteen months of age were included in the probiotic trial (Median: 12 months). The probiotic was fed for 28 days to the Probiotic Group. Both the Probiotic and Control groups were monitored for 70 days prior to the administration of the probiotic and 14 days after administration.

The feeding of the cheetah-specific probiotic resulted in an increase of weight in the treatment group ($p=0.026$, ANOVA, $p<0.05$) in comparison to the Control Group. There was a relative improvement in the faecal quality in the Probiotic Group in comparison to the Control Group. This was accompanied by an absence of blood and mucus in the faeces, which had been present prior to the start of the 28-day administration of the probiotic.

The feeding of a cheetah-specific probiotic resulted in an improved weight gain and food conversion in the Probiotic Group in comparison to the Control Group as well as in a reduction of diarrhoea in the Probiotic Group. More research is needed on the effect of the probiotic on different age groups and animals suffering from specific diseases such as liver disease and gastritis.

Opsomming

DIE GEBRUIK VAN 'n PROBIOTIKUM IN JAGLUIPERDS (*Acinonyx jubatus)* IN GEVANGENESKAP

Deur

Katja Natalie Koeppel

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Die projek was onderneem om die normale dermflora van gesonde jagluiperds te bepaal en ‘n species-spesifieke probiotikum to produseer vir gebruik in jong jagluipers in gevangeneskap om gewigstoename te verbeter en diarree te verminder.

Die normale dermflora van gesonde jagluiperds was bepaal deur die gebruik van nie-selektiewe and selektiewe groei media. Hoë getalle anaerobe en aerobe bakterieë was geisoleer vanuit die faeces van jagluiperds gedurende hierdie studie. Agt persent van die isolate was *Enterococcus* spp.. Beide *Enterococcus faecium* en *Lactobacillus* Groep 1 was geselekteer vir gebruik in die probiotikum.

Sewe en twintig jong jagluiperds tussen die ouderdomme van agt en dertien maande was ingesluit in die probiotikum proef (Gemiddeld: 12 maande). Die probiotikum was gevoer vir 28 dae aan die probiotikum groep. Beide die probiotikum en kontrole groepe was waargeneem vir 70 dae voor toediening van die probiotikum en 14 dae daarna.

Die inname van die jagluiperd-spesifieke probiotikum het ‘n toename in gewig teweeggebring in die behandelde groep ($p=0.026$, ANOVA, $p<0.05$) in vergelyking met die kontrole groep. Daar was ‘n relatiewe verbetering in die kwaliteit van faeces in die probiotikum groep in vergelyking met die kontrole groep. Dit het gepaard gegaan met ‘n afwesigheid van bloed en slym in die faeces wat wel teenwoordig was voor die 28 dae toedieningsperiode van die probiotikum.

Die inname van ‘n jagluiperd-spesifieke probiotikum het gewigstoename en verbeterde voeromset teweeggebring in die probiotikum groep asook ‘n vermindering van diarree, in vergelyking met die kontrole groep. Meer navorsing word benodig om die effek waar te neem van die probiotikum op verskillende ouderdomsgroepe van jagluiperds wat lei aan spesifieke siektes soos lewerversaking en gastritis.

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Abbreviations

BHI	brain heart infusion
BilT	total bilirubin
CO_2	carbon dioxide gas
CFU	colony forming unit
CG	Control Group
CPV	canine parvovirus
°C	degrees Celsius
EDTA	ethylenediaminetetraacetic acid
FCoV	feline enteric coronavirus
FeLV	feline leukaemia virus
FIP	feline infectious peritonitis
FIV	feline immunodeficiency virus
FPLV	feline panleukopenia virus
g	gram
GI	gastrointestinal
Hb	haemoglobin
Ht	haematocrit
KNP	Kruger National Park
l	litre
L	lactulose
MCHC	mean cell haemoglobin concentration
MCV	mean cell volume
min	minutes
ml	millilitre
mg	milligram
MRS	De Man, Rogosa and Sharpe
PBS	phosphate buffered saline
PCR	polymerase chain reaction
PG	Probiotic Group
R	rhamnose
RBCC	red blood cell count

RLB	reverse line blot
RNA	ribonucleic acid
SD	standard deviation
SIBO	small intestinal bacterial overgrowth
Spp.	species
ThrC	thrombocyte count
TSP	total serum protein
WG	weight gain
XLD	xylose lysine deoxychocolate
µg	microgram
µl	microlitre

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