OCCURRENCE AND DIVERSITY OF BOVINE COCCIDIA AT THREE LOCALITIES IN SOUTH AFRICA

by

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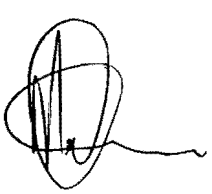
I declare that the dissertation, which I hereby submit for the degree Magister Scientiae (Veterinary Sciences) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at another university.



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SUMMARY

There is no information on the *Eimeria* species of cattle that occur in South Africa in different management systems. This information is important to the management and control of coccidiosis.

The study was expected to provide baseline data on the *Eimeria* species that occur at the selected study sites. The objectives of the study were to determine the *Eimeria* species that are present in the animals and to assess the infection levels of the parasites in the animals.

Three locations were used for sampling: Mallesons in Pretoria East, a Nguni stud farm in Pienaars River and Kaalplaas. Samples were collected monthly from November 1997 to November 1998. Age was taken into account when analysing the results by differentiating between young calves and older animals.

The McMaster technique was used to determine oocysts per gram of faeces (OPG). Specimens with OPG's of >2000 were sporulated for species identification.

There were significant differences in the occurrence of positive specimens from the three localities, with Pienaars River having the highest number (52%).

There were significant differences in the occurrence of positive specimens from adults at the three localities, with Pienaars River having the highest number (29%).

There were significant differences in the occurrence of positive specimens from calves at the three localities, with Kaalplaas having the highest number (82%).

At each locality, the occurrence of positive specimens was significantly greater in calves than in adults. Calves also had higher coccidial counts than adult animals.

Eight *Eimeria* species were identified at Mallesons from sporulated calf specimens. The most prevalent species were *E. zuernii* and *E. ellipsoidalis*.

Four *Eimeria* species were identified at Pienaars River from two sporulated adult animal specimens. The two most important species, *E. bovis* and *E. zuernii,* were present in both specimens. Six *Eimeria* species were identified at Pienaars River from sporulated calf specimens. The most prevalent species were *E. bovis* and *E. zuernii*.

Twelve *Eimeria* species were identified at Kaalplaas from sporulated calf specimens. The most prevalent species were *E. zuernii* and *E. bovis*.

Veterinary important species of *Eimeria* were compared and there were significant differences in their abundance at the three localities, with Kaalplaas having the highest counts.

The study has shown that proper management systems can prevent outbreaks of coccidiosis in intensively managed farms (Mallesons). Although species like *E. zuernii* are present in the animals, they are not a threat as long as management standards are not lowered.

Coccidiosis was not a problem at Pienaars River and Kaalplaas. Our study has shown that although animals on pastures carry pathogenic species of *Eimeria*, the animals did not necessarily suffer from the disease, hence careful monitoring of the animals is important during times of possible stress.

OPSOMMING

Inligting ontbreek oor die voorkoms van *Eimeria* spesies van beeste onder verskillende bestuurstelsels in Suid-Afrika. Sodanige inligting is belangrik vir die bestuur en beheer van koksidiose.

Na verwagting sou die studie basisdata oplewer oor die *Eimeria* spesies wat in die studiegebiede voorkom. Die oogmerk van die studie was om vas te stel watter *Eimeria* spesies in die diere teenwoordig is, asook wat die besmettingsvlak is.

Monsters is op drie plekke versamel: Malleson se plaas (Pretoria-Oos), 'n Ngunistoetplaas by Pienaarsrivier en op Kaalplaas. Monsters is maandeliks versamel van November 1997 tot November 1998. Ouderdom is in ag geneem toe die resultate ontleed is deurdat tussen kalwers en volwasse diere onderskei is.

Die McMaster-tegniek is gebruik om oösiste per gram faeces (OPG) te bepaal. Monsters met OPG > 2000 is laat sporuleer vir die uitkenning van spesies.

Die verskille tussen die voorkoms van positiewe monsters op die drie plekke was betekenisvol, met die hoogste aantal (52%) by Pienaarsrivier.

Die verskille tussen die voorkoms van positiewe monsters van volwasse diere op die drie plekke was betekenisvol, met die hoogste aantal (29%) by Pienaarsrivier.

Die verskille tussen die voorkoms van positiewe monsters van kalwers op die drie plekke was betekenisvol, met die hoogste aantal (82%) op Kaalplaas.

By elke plek was die voorkoms van positiewe monsters by kalwers betekenisvol hoër as by volwassenes. Oösisttellings by kalwers was ook hoër as by volwassenes.

Agt *Eimeria* spesies is uit gesporuleerde kalfmismonsters by Malleson geïdentifiseer. Die algemeenste spesies was *E. zuernii* en *E. ellipsoidalis.*

Vier *Eimeria* spesies is uit twee gesporuleerde mismonsters van volwasse beeste by Pienaarsrivier geïdentifiseer. Die twee belangrikste spesies, *E. bovis* en *E. zuernii*, was in albei monsters teenwoordig. Ses *Eimeria* spesies is uit gesporuleerde kalfmismonsters by Pienaarsrivier geïdentifiseer. Die algemeenste spesies was *E. bovis* en *E. zuernii.*

Twaalf *Eimeria* spesies is uit gesporuleerde kalfmismonsters by Kaalplaas geïdentifiseer. Die algemeenste spesies was *E. zuernii* en *E. bovis.*

Die verskille in die voorkoms van *Eimeria* spesies van veeartsenykundige belang op die drie plekke was betekenisvol; die hoogste tellings was op Kaalplaas.

Die studie het duidelik getoon dat 'n doeltreffende bestuurstelsel die uitbreek van koksidiose op 'n intensief bestuurde plaas (Malleson) kan verhoed. Alhoewel

belangrikse spesies soos *E. zuernii* daar teenwoordig is, blyk hulle nie 'n bedreiging te wees nie, mits die bestuurstandaard nie verlaag word nie.

Koksidiose was nie 'n probleem op Pienaarsrivier of Kaalplaas nie. Hierdie studie het getoon dat diere op veldweiding wat met patogene *Eimeria* spesies besmet is nie noodwending kliniese tekens van koksidiose toon nie. Sorgvuldige monitering van die diere tydens strestye sou egter raadsaam wees.

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