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**Epidemiology of coccidiosis in calves and control of coccidiosis using  
toltazuril at the time of weaning.**

This thesis is presented in partial fulfilment of the requirements for the degree of  
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**in Veterinary Parasitology**  
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**Abstract:**

Two separate studies were conducted to investigate the impact of coccidiosis in young calves. In one study calves were reared to weaning (100kg liveweight) by feeding meal with or without monensin added. The oocyst counts were low in both groups up to weaning and there was no statistically significant ( $p < 0.05$ ) improvement in terms of body weight or a decline in oocyst counts in the monensin-treated group. At weaning a single dose of toltrazuril (20mg/kg) was given to half the calves in both groups. A similar treatment regime was given in a second study where calves had been raised to weaning by commercial calf rearers. Half of these were treated with toltrazuril (20mg/kg) and half not. In both studies there was a statistically significant ( $p < 0.001$ ) reduction in oocyst counts in treated calves which remained very low for 4-5 weeks post treatment. The treatment also significantly increased ( $p < 0.001$ ) weight gains in treated calves by 3-5kgs at 5-6 weeks post treatment. The coccidial status of other calves on a variety of farms were also monitored including a group of organic beef farms. High oocyst counts were noted on occasions where calves were not on anti-coccidial treatment. Low oocyst counts were noted in adult cows where they were examined. The two most prevalent species overall were *Eimeria zuernii* (95%) and *E. bovis* (87%) followed by *E. auburnensis* (62%), *E. cylindrica* (42%), *E. canadensis* (31%), *E. wyomingensis* (23%), *E. bukidnonensis* (36%), *E. ellipsoidalis* (24%), *E. alabamensis* (12%), *E. brasiliensis* (12%), and *E. subspherica* (27%). The most predominant species, measured as the most numerous oocysts overall, were *E. bovis* (31%) followed by *E. zuernii* (27%), *E. auburnensis* (13%), *E. bukidnonensis* (7%), *E. cylindrica* (6%), *E. wyomingensis* (5.3%), *E. canadensis* (4.4%), *E. ellipsoidalis* (3.3%), *E. brasiliensis* (1.9%), *E. subspherica* (1.5%), and *E. alabamensis* (1%). The most prevalent species were also the most pathogenic species. On many occasions calves were infected with more than one species, sometimes as many as 5-6 *Eimeria* species. A redescription of the 11 species of *Eimeria* in cattle identified from New Zealand Farms was made.

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## Abbreviations

Sr- Square root  
IFAT- Indirect fluorescent antibody Test  
DAI- Days After Infection  
LG - Low grade  
HG - High grade  
S.I. - small intestine  
P.I. -Post infection  
PP - pre patent  
L.A - lasalocid  
DEC -Decoquinate  
MDBK -Madin-Darby Bovine Kidney  
SDS - Sodium Dodecyl Sulphate  
ELISA- Enzyme linked immunosorbant assay  
PAGE- polyacrylamide gel electrophoresis  
PVDF-Polyvinylidene Fluoride  
FOC- Faecal oocyst count  
PBL- Peripheral blood Leucocytes  
PMN – Peripheral mononuclear Cells  
NK – Natural killer cells  
IEL- Intra Epithelial Lymphocytes  
CMI- Cell mediated Immunity  
IgG, IgA, IgM- Immunoglobulin G, A, M etc.  
KDa- KiloDalton  
Fc - Faecal Consistency  
SE - Standard Error  
VERO - African Monkey Kidney Cells  
ANOVA – Analysis of variance  
CO- Conventional  
NC- No Chemical  
IELs – Intraepithelial Lymphocytes  
P- Probability  
LSM- Least square mean  
SRT- square root transformation

