

**EVALUATION OF pH AND OSMOLALITY LEVELS IN THE
SMALL INTESTINE OF RATS (*RATTUS NORVEGICUS*) AND
CHICKENS (*GALLUS GALLUS*) EXPERIMENTALLY INFECTED
WITH *TRICHINELLA ZIMBABWENSIS*.**

by

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DECLARATION

BY

CANDIDATE

**This thesis is my own original work and has not been presented for a
degree at any other University**

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BY SUPERVISOR

**This thesis has been submitted for examination with my approval as
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ABBREVIATIONS

NCDC	National centre of disease control United States of America
NIH	National Institute of Health
HCL	hypochloric acid
NaCl	sodium chloride
p. i	post infection
mm	millimeters
SE	standard error
μl	microliter
°C	degrees Celsius
rpm	revolutions per minute
ml/h	milliliter per hour
ad lib	ad libitum
L₁ g⁻¹	first stage larvae per gram
g	gram
%	percent
Ig	immunoglobulin
IL	interleukin
IFN	interferon
KG	kilogram
M	molar
meq	milli equivalents
BW	body weight

PU	pepsin unit
NGF	nerve growth factor
h	hour
pH	hydrogen ion
LEWIS, LOU, PVG, AO and WKA/H	names of different strains of rats
SCID	strain of mice deficient in B and T lymphocytes
CD-1	mice strain
IFN γ, TNFα	interferon gamma and tumor necrosis factor alpha
CD4+, OX22- (CD45RC-) CD4+, OX22+ (CD45RC+)	memory phenotypes of the T lymphocyte cell receptor
FcϵR1Fo	mast cell receptor
Th	helper T lymphocyte cells
CD4	receptor type found on T lymphocyte cells

ABSTRACT

In order to evaluate the levels of pH and osmolality in the establishment and survival of *T. zimbabwensis*, 10 weeks old male rats (*Rattus norvegicus*) and 3 weeks old chicks (*Gallus gallus*) were each subdivided into four groups. Group 2 and group 4 were fed muscle tissue containing 1000 infective L₁ stage larvae, while group 1 and 3 were used as controls. Using a standardized post-prandial time, the rats in group 1 and 2 were sacrificed on days 2, 5, 7 and 10 p. i and chickens in groups 3 and 4 on day 2 and 5 p. i. Significant increase ($p < 0.05$) in pH in the anterior segment was observed at day 5 p. i in rats. In the posterior segment of infected rats, there was a significant decrease ($p < 0.05$) in pH at day 2 p. i and a significant increase ($p < 0.05$) at day 5, 7 and 10 p. i when compared to the controls. There were no significant pH differences ($p > 0.05$) in chickens.

In infected rats, osmolality of the anterior segment of the small intestine increased significantly ($p < 0.05$) at day 2 p. i before declining at day 5 p. i and in the posterior section, osmolality significantly increased at day 2 p. i. The increase in osmolality levels in chickens at day 2 and at day 5 p. i was not significant ($p > 0.05$).

It may be concluded that in *Trichinella* infection, luminal pH and osmolality are altered at certain stages of the parasite's life cycle in the small intestine and this alteration is probably crucial for the establishment and survival of the parasite.