



Kalyakorn Wongrak (Autor)

Epidemiological studies on gastro-intestinal nematode infections in chickens

On farm establishment, host genetics and fluctuations in
nematode egg excretion

Department of Animal Sciences
Georg-August-Universität Göttingen, Germany



**Epidemiological studies on gastro-intestinal
nematode infections in chickens: on farm
establishment, host genetics and
fluctuations in nematode egg excretion**



Kalyakorn Wongrak

 Cuvillier Verlag Göttingen
Internationale wissenschaftliche Fachverlag

<https://cuvillier.de/de/shop/publications/6796>

Copyright:

Cuvillier Verlag, Inhaberin Annette Jentzsch-Cuvillier, Nonnenstieg 8, 37075 Göttingen,

Germany

Telefon: +49 (0)551 54724-0, E-Mail: info@cuvillier.de, Website: <https://cuvillier.de>



TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	vii
LIST OF TABLES.....	xiv
LIST OF FIGURES.....	xv
LIST OF ABBREVIATIONS.....	xvii
SUMMARY.....	1

Chapter 1

<i>General Introduction</i>	5
1.1 Foreword.....	6
1.2 Laying hens in Germany.....	7
1.3 Free-range chicken systems.....	8
1.4 Importance of poultry nematodes.....	9
1.4.1 <i>Ascaridia galli</i>	10
1.4.2 <i>Heterakis gallinarum</i>	11
1.4.3 <i>Capillaria</i> spp.....	12
1.5 Genetic variation in parasite infections.....	14
References.....	14

Chapter 2

<i>Establishment of gastro-intestinal helminth infections in free-range chickens: a longitudinal on farm study</i>	21
Abstract.....	22
Zusammenfassung.....	23
2.1 Introduction.....	24
2.2 Materials and methods.....	26
2.2.1 Farm, hen and management.....	26
2.2.2 Parasitological examinations.....	26
2.2.3 Statistical analyses.....	27
2.3 Results.....	28
2.3.1 Faecal egg counts of LB classic hens over two production years.....	28
2.3.2 Body weight and mortality rate in LB plus and LB classic.....	29
2.3.3 Faecal egg counts of LB classic and LB plus hens.....	30



2.3.4 Average worm burden.....	30
2.4 Discussion.....	32
2.4.1 Epidemiological factors effecting nematode infections.....	32
2.4.2 Mortality, welfare and choice of animal genetic material for free-range chickens.....	35
2.5 Conclusions.....	36
Acknowledgements.....	36
References.....	37

Chapter 3

<i>Genetic variation for worm burdens in laying hens naturally infected with gastrointestinal nematodes.....</i>	43
Abstract.....	44
3.1 Introduction.....	45
3.2 Materials and methods.....	46
3.2.1 Experimental farm, animals and management.....	46
3.2.2 Parasitological examinations.....	47
3.2.3 Statistics.....	47
3.3 Results.....	48
3.3.1 Observations on the faecal egg counts and mortality.....	48
3.3.2 Worm burdens.....	49
3.3.3 Phenotypic and genetic correlations and heritability estimates.....	50
3.4 Discussion.....	52
3.5 Conclusions.....	55
Acknowledgements.....	55
References.....	56

Chapter 4

<i>Diurnal fluctuations in nematode egg excretion in naturally and experimentally infected chickens.....</i>	59
Abstract.....	60
4.1 Introduction.....	61
4.2 Materials and methods.....	62
4.2.1 Chickens and faeces collection procedures.....	62

4.2.2 Parasitological examinations.....	63
4.2.3 Statistical analyses.....	63
4.3 Results.....	64
4.3.1 Prevalence and worm counts.....	64
4.3.2 Faeces and nematode egg excretion within and between days.....	66
4.3.3 Climatic conditions.....	72
4.4 Discussion.....	73
4.4.1 Infections and worm species involved.....	73
4.4.2 Factors affecting nematode egg excretion and diurnal fluctuations.....	74
4.4.3 Diurnal fluctuations in nematode egg excretion.....	75
4.5 Conclusions.....	77
Acknowledgements.....	77
References.....	78
Chapter 5	
<i>General discussion</i>	83
5.1 Body weight and mortality in free-range chickens.....	84
5.2 Prevalence and burden of gastrointestinal helminth infections in free- range chickens.....	85
5.3 Establishment and development of nematode infections in free-range chickens.....	86
5.4 Factors affecting nematode egg excretion.....	87
5.5 Genetic variations in nematode infections.....	89
5.6 General conclusions.....	91
References.....	91
LIST OF PH.D.-RELATED PUBLICATIONS.....	97
CURRICULUM VITAE.....	98