



# **Kafrelsheikh University**

Faculty of Veterinary Medicine  
Animal Medicine Department  
(Infectious Diseases)

## **FIELD AND EPIDEMIOLOGICAL STUDY ON THE ROLE OF DOGS IN TRANSMISSION OF *NEOSPORA CANINUM* TO CATTLE AT KAFR ELSHEIKH GOVERNORATE**

A Thesis Presented

**By**

**Ali Gaber Soliman Gaber**

*B.V.Sc., 2007 - M.V.Sc., 2015*

**For**

**The degree of Ph. D. in  
Vet. Medical Science  
(Infectious Diseases)**

**Under Supervision of**

**Prof. Magdy H. Al-Gaabary**

**Prof. of Infectious Diseases and Head of Animal Medicine Department**

**Faculty of Veterinary Medicine**

**Kafrelsheikh University**

**Dr. Taher M. Abdel Wahab**

**Emeritus Head Researcher of Animal  
Health Research Institute  
Kafrelsheikh Lab**

**Dr. Yamen M. Hegazy**

**Assistant Prof. of Infectious Diseases  
Faculty of Veterinary Medicine  
Kafrelsheikh University**

**2021**

## LIST OF TABLES

<b>No</b>	<b>Title</b>	<b>Page</b>
<b>1</b>	Principal characteristics of the invasive stages of <i>N. caninum</i> .	<b>16</b>
<b>2</b>	Samples collected from different districts at Kafrelsheikh governorate for serological diagnosis of neosporosis.	<b>43</b>
<b>3</b>	Prevalence of seropositive abortion cases among cows at different districts of Kafrelsheikh governorate.	<b>51</b>
<b>4</b>	Distribution of heifers that may be seropositive infected with vertical transmission at different districts of Kafrelsheikh governorate using iELISA.	<b>52</b>
<b>5</b>	Results of the questionnaire survey towards neosporosis in Egypt.	<b>55</b>
<b>6</b>	Articles passed the meta analysis screening process.	<b>60</b>
<b>7</b>	Different clinical and epidemiological findings associated with different causes of abortion in dairy herds in Egypt.	<b>62</b>

## LISTS OF FIGURES

No	Title	Page
1	Transmission of <i>N. caninum</i> infection.	8
2	Heteroxenous life-cycle of <i>N. caninum</i> .	15
3	Preventive strategies for controlling of <i>N. caninum</i> infection.	34
4	Map of Egypt showing the administrative boundaries of Kafrelsheikh governorate.	41
5	A and B pictures showing presence of dogs with cattle in the same herd with freely access to feed and water sources.	53
6	A,B,C,D,E,F,G diagrams showing the clinical and epidemiological features of most abortive agents in Egypt.	64
7	Most common differential clinical signs in various abortive diseases in Egypt.	71

## LIST OF ABBREVIATIONS

AHRI	=	Animal Health Research Institute
BPA	=	Bovine polyclonal anti- <i>N. caninum</i>
CELISA	=	Competitive Enzyme-linked immunosorbent assay
DAT	=	Direct agglutination test
ELISA	=	Enzyme-linked immunosorbent assay
FA	=	Follicular aspirates
FSH	=	Follicle stimulating hormone
IB	=	Immunoblotting
IFAT	=	Indirect fluorescent antibody test
IFN- $\gamma$	=	Gamma interferon
LAT	=	Latex agglutination test
mAb	=	Monoclonal antibody
mPCR	=	Multiplex polymerase chain reaction
Nc-1	=	A strain of <i>Neospora caninum</i>
NcGRA7	=	<i>N. caninum</i> dense granule protein 7
NcSAG1	=	<i>N. caninum</i> surface antigen 1
nPCR	=	Nested polymerase chain reaction
OprI	=	Outer membrane lipoprotein from <i>Pseudomonas aeruginosa</i>
PAS	=	Periodic acid Schiff reaction
PBS	=	Phosphate buffered saline
UF	=	Uterine flushes
WB	=	Western blot

## CONTENTS

	<b>Page</b>
<b>INTRODUCTION.....</b>	<b>1</b>
<b>REVIEW OF LITERATURE .....</b>	<b>6</b>
1. History of <i>Neospora caninum</i> .....	6
2. Epidemiological features of <i>Neospora caninum</i> .....	7
3. Life cycle of <i>Neospora caninum</i> .....	15
4. Diagnosis of <i>Neospora caninum</i> infection .....	21
5. Economic impacts of <i>Neospora caninum</i> infection .....	31
6. Control strategies of <i>Neospora caninum</i> infection .....	34
<b>MATERIALS AND METHODS .....</b>	<b>40</b>
1. Materials .....	40
2. Methods.....	45
<b>RESULTS.....</b>	<b>51</b>
<b>DISCUSSION .....</b>	<b>72</b>
<b>SUMMARY .....</b>	<b>80</b>
<b>CONCLUSION.....</b>	<b>82</b>
<b>RECOMMENDATIONS.....</b>	<b>83</b>
<b>REFERENCES.....</b>	<b>84</b>
<b>APPENDIX.....</b>	<b>118</b>
<b>ARABIC SUMMARY</b>	

# SUMMARY

---

## SUMMARY

Neosporosis in Egypt has drawn a little attention of both farmers and researchers due to brucellosis is well known to be the main cause of abortion in dairy farms. Therefore, the present study was carried out to investigate neosporosis on dairy cattle herds from different areas in Kafrelsheikh governorate and assessment the knowledge, attitude and practices of the farmers towards *N. caninum* infection in dairy herds, which could help in preparing a control plan for neosporosis.

Results obtained in this study showed that the overall seroprevalence of *N. caninum* in the examined abortion cases was estimated at 38.04% (35/92), on the other hand, the Apperent prevalence of *N. caninum* among the 25 examined heifers born from seropositive previously had abortion animals, was estimated at 28% (7/25). The present study showed that *N. caninum* infection is a neglected widely spread problem in dairy herds of Kafrelsheikh governorate and the vertical route of disease transmission considered the most predominant route in *N. caninum* infection.

In the present study, the results of the questionnaire survey to assess the farmers' KAPs in Egypt towards neosporosis, indicate that all of the farmers who participated in the study (N= 41) do not know about *N. caninum* infection and its role in the abortion of their cows. Furthermore, they confirmed that they do not know the role of dogs in disease transmission to their animals.

# SUMMARY

---

Moreover, this study showed the widespread of mangemental practices among farmers which increase the risk of infection to cattle such as Keeping abortion cases, buying animals that had an abortion, breeding of heifers born from animals which previously had abortion and offering the aborted materials to dogs.

In the current study, using the epidemiological data and clinical picture through carrying out meta-analysis study on abortion in dairy cattle in Egypt showed that there are some specific signs that indicate an infectious agent is responsible for abortion in dairy herds which help in selection of the appropriate testing protocols for confirmation. Neosporosis is associated with abortion only and it has not effect on either the milk production or the reproductive status of animals.