

ROLE OF RATS IN SPREADING OF BRUCELLA INFECTION IN CATTLE.

A Thesis
Presented to Graduate School
Faculty of Veterinary Medicine, Alexandria University
In Partial fulfillment of the
Requirement for The Degree
Of
Master of Veterinary Sciences
In
MICROBIOLOGY

By
Caroline Fayez Fahmy Nawar
(B. V. SC, 2003, Zagazig Univ)

ACKNOWLEDGEMENT

I wish to express my sincere thanks and deepest gratitude to

Prof. Dr. Helmy Ahmed Torky

professer of microbiology . faculty of veterinary medicine . Alexandria university. for his kind supervision , continuous encouragement valuable advice and criticism

I am greatly indebted to

Prof. Dr .Ibrahim Gad Abdella Ibrahim

head of reproductive research disease department in animal reproductive research institute for his kind supervision , close follow up , continuous advice during the technical work .

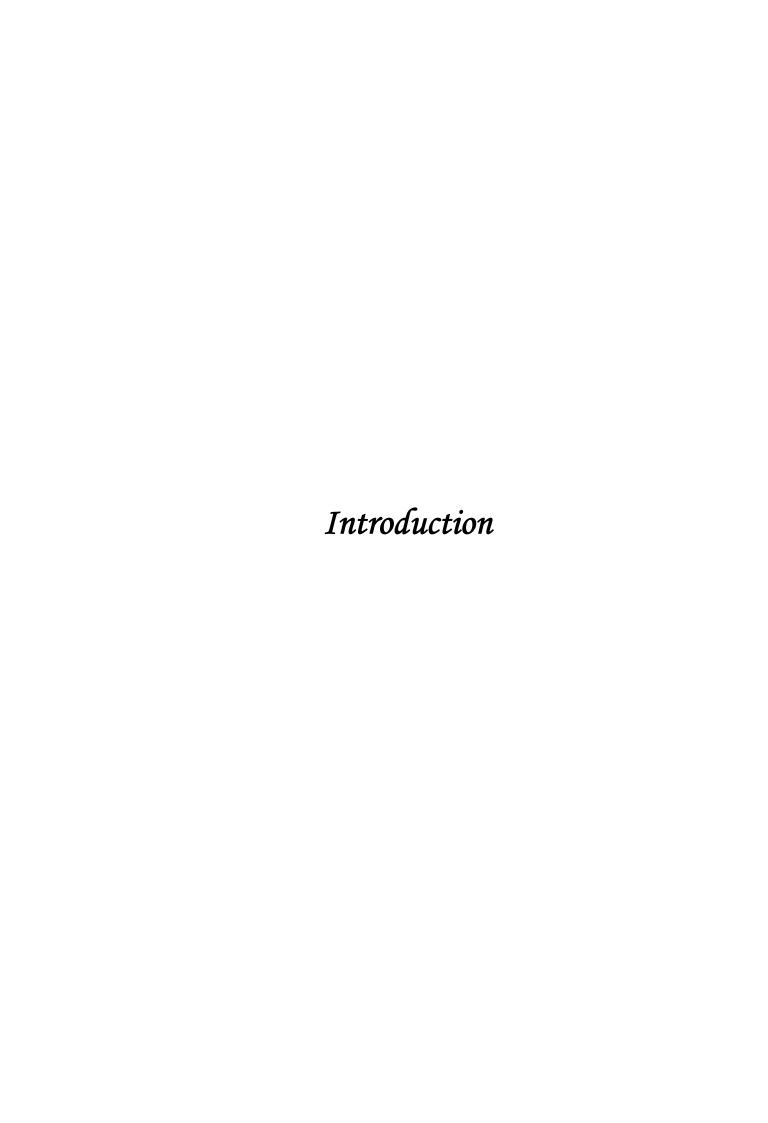
LIST OF CONTENTS

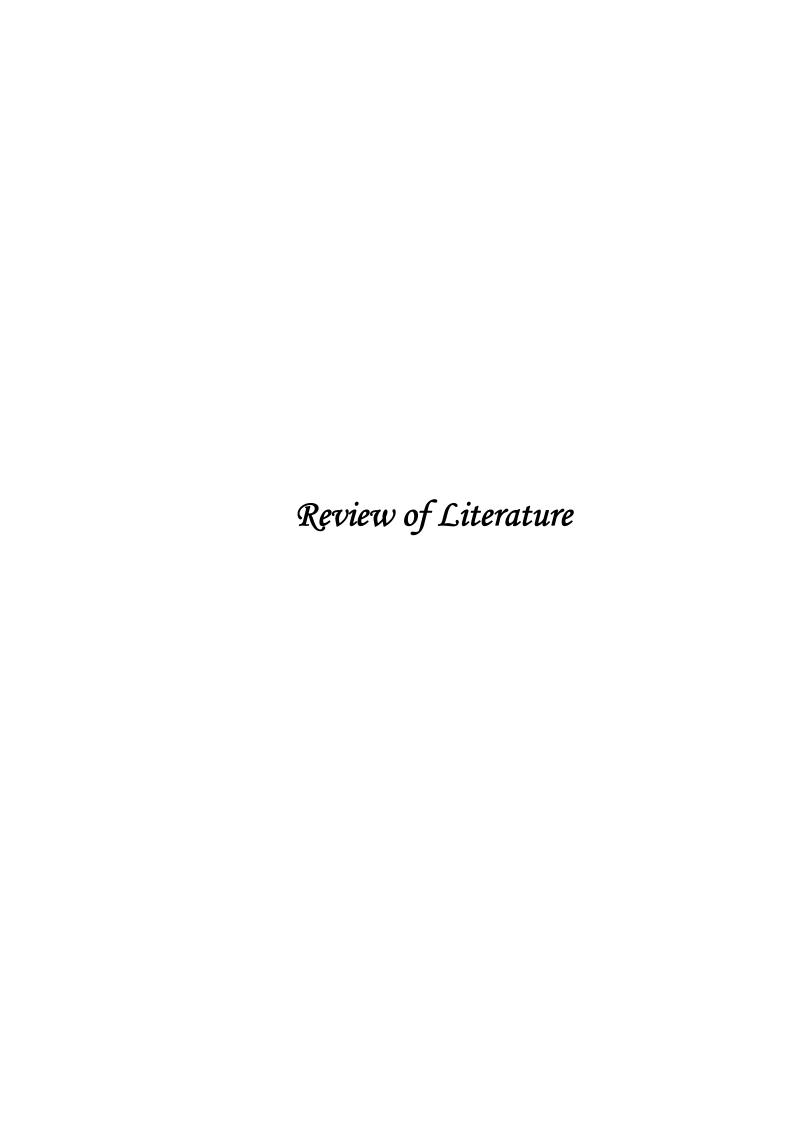
1.	INTRODUCTION	. 1
2.	REVIEW OF LITERATURE	. "
	Historical over view and distribution of Brucella	
	Diagnosis of brucellosis	
	Brucella in rats	
3.	MATERIALS ANDMETHODS	
٥.	3.1 Material	
	3.1.1 Rats	
	3.1.2 Sampling	
	3.1.3 Chemicals and reagents	١٣
	3.1.3.1 Chemicals and reagents for Rose Bengal test (RBT)	١٣
	3.1.3.2 Chemicals and reagents for Standard Tube Agglutination test (SAT)	
	3.1.3.3 Chemicals and reagents for Rivanol test (RT)	
	3.1.3.4 Chemicals and reagents for EDTA modified SAT	10
	3.1.3.5 Positive and negative sera	١٥
	3.1.3.6 Mono specific anti sera	
	3.1.3.7 Basal media	10
	3.1.3.8 Dyes for sensitivity test media	
	3.1.3.9 Stains	
	3.1.3.10 Lead acetate	
	3.1.3.11 Brucella strains	
	3.2. Methods	
	3.2.1. Collection of samples	
	3.2.2. Diagosis	
	3.2.2.1 Serological diagnosis	1 1 1
	3.2.2.1.1 Rose Bengal Test(RBT)	
	3.2.2.1.2 Standard Tube Agglutination Test (SAT)	
	3.2.2.1.3 Rivanol test	
	3.2.2.1.4 EDTA modified SAT	
	3.2.3. Bacteriological examination	
	a) Isolation of brucella organisms	
	b) Identification of brucella isolates	
	. CO2 Requirment	
	H2S Production	
	. Urease activity	
	Growth in the presence of dyes	
	. Agglutination with mono specific antisera	
4.		
4. 5.	4.1 Results of serological test	
	4.2. Results of bacteriological examination	
6.		
7.		
8.	ARABIC SUMMARY	0

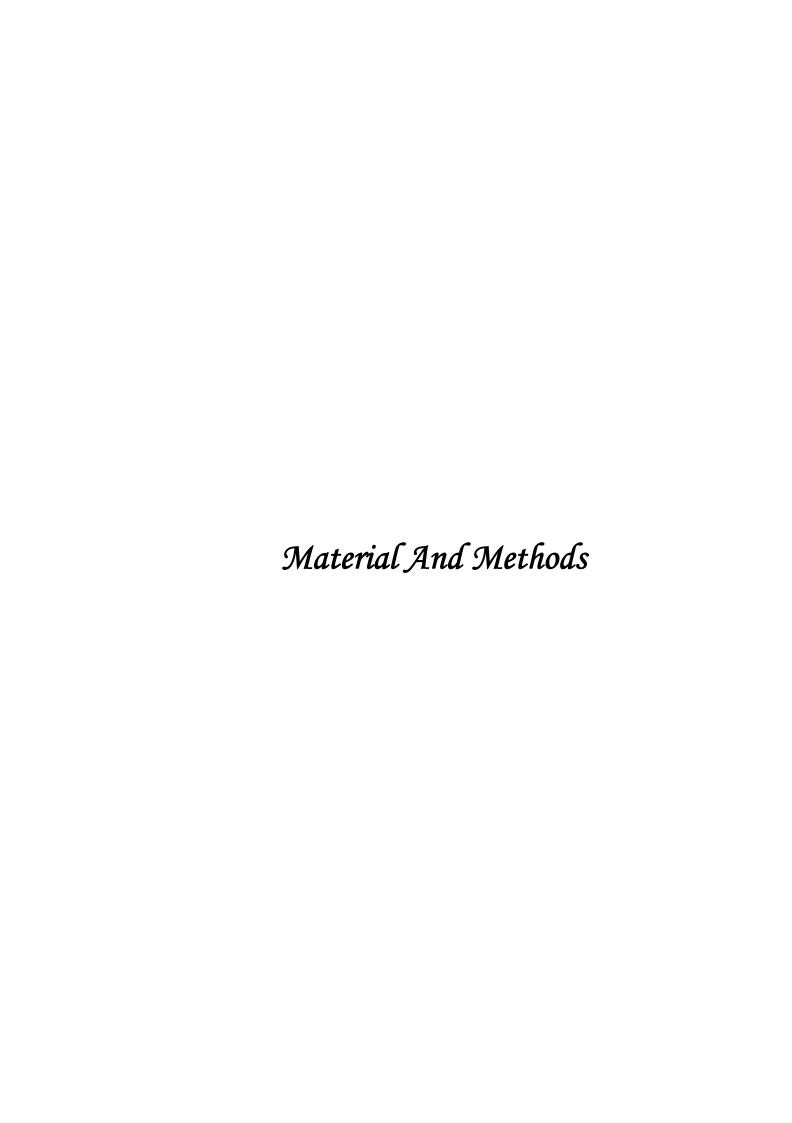
LIST OF TABLES

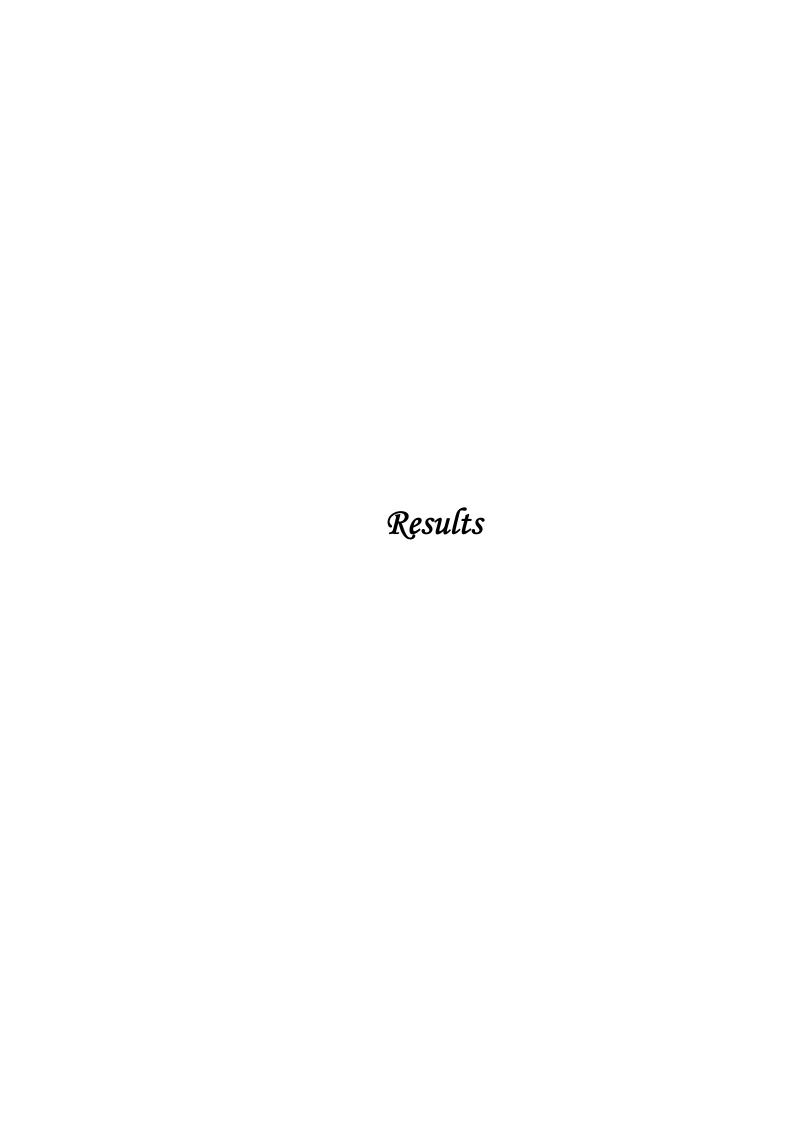
Table (1): Setting the final concentration of inhibitors and dye sensitivity media preparation22	
Table (2): Conversion of brucella abortus serum agglutination test to international units (IU/ML)	
Table (3): Results of Rose Bengal test (RBT) in naturally infected rats	
Table (4):Results of Tube Agglutination test (SAT) in Naturally infected rats	
Table (5): Results of EDTA modified SAT in naturally infected rats	
Table (6): Results of Rivanol test (RT) in naturally infected rats 24	
Table (7): Results of Rose Bengal test in experimental Infected GroupI	
Table (8): Results of Tube Agglutination test in experimental infected GroupI	;
Table (9): Results of EDTA modified SAT in experimental infected GroupI	5
Table (10): Results of Rivanol test in experimental Infected GroupI	5
Table (11): Results of Rose Bengal test in experimental Infected GroupII	6
Table (12): Results of Tube Agglutination test in experimental infected GroupII	6
Table (13): Results of EDTA modified SAT in experimental infected GroupII	7
Table (14):Results of Rivanol test in experimental Infected GroupII	7
Table (15): Results of Rose Bengal test in experimental Infected GroupIII	8
Table (16): Results of Tube Agglutination test in experimental infected Group III	3

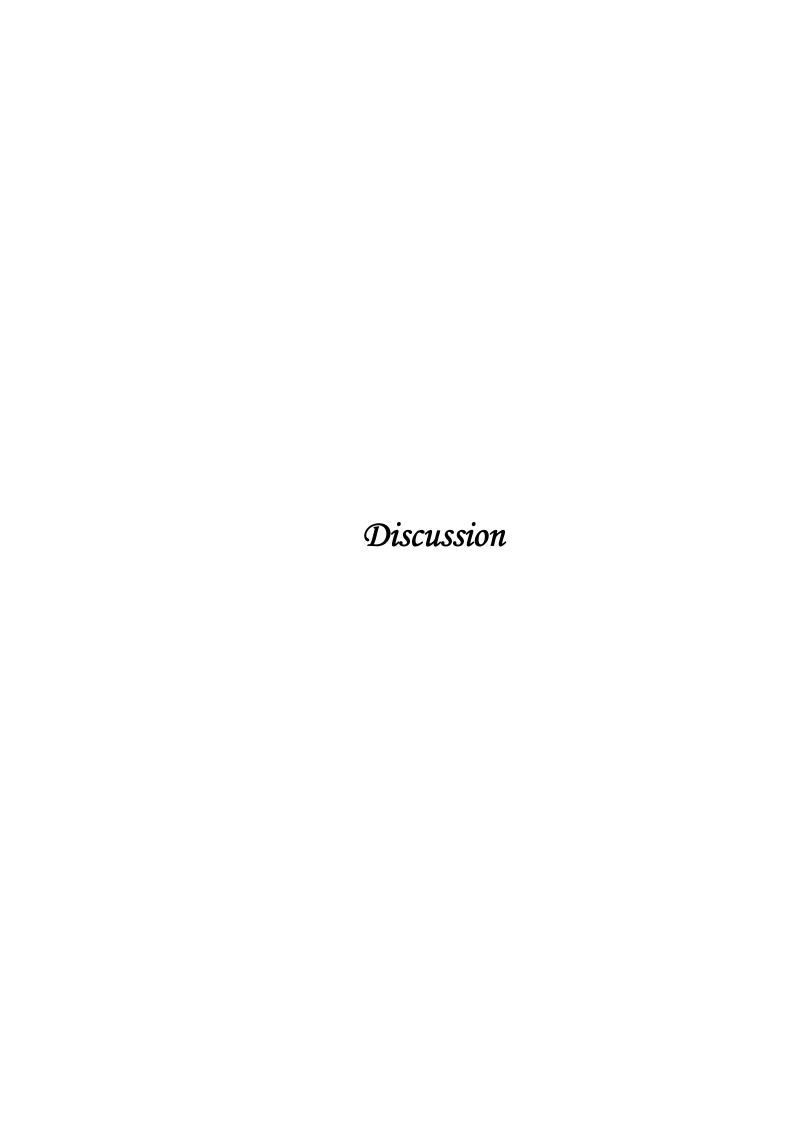
Table (17): Results of EDTA modified SAT in experimental infected GroupIII	28
Table (18): Results of Rivanol test in experimental Infected GroupIII	29
Table (19): Results of Rose Bengal test in experimental Infected GroupIV	29
Table (20): Results of Tube Agglutination test in experimental infected GroupIV	.29
Table (21): Results of EDTA modified SAT in experimental infected GroupIV	30
Table (22): Results of Rivanol test in experimental Infected GroupIV	.30
Table (23): Results of bacteriological examination in naturally infected rats	30
Table (24): Results of bacteriological examination in naturally infected rats GroupI	31
Table (25): Results of bacteriological examination in naturally infected rats GroupII	.31
Table (26): Results of bacteriological examination in naturally infected rats GroupIII	31
Table (27): Results of bacteriological examination in naturally infected rats GroupIV	32

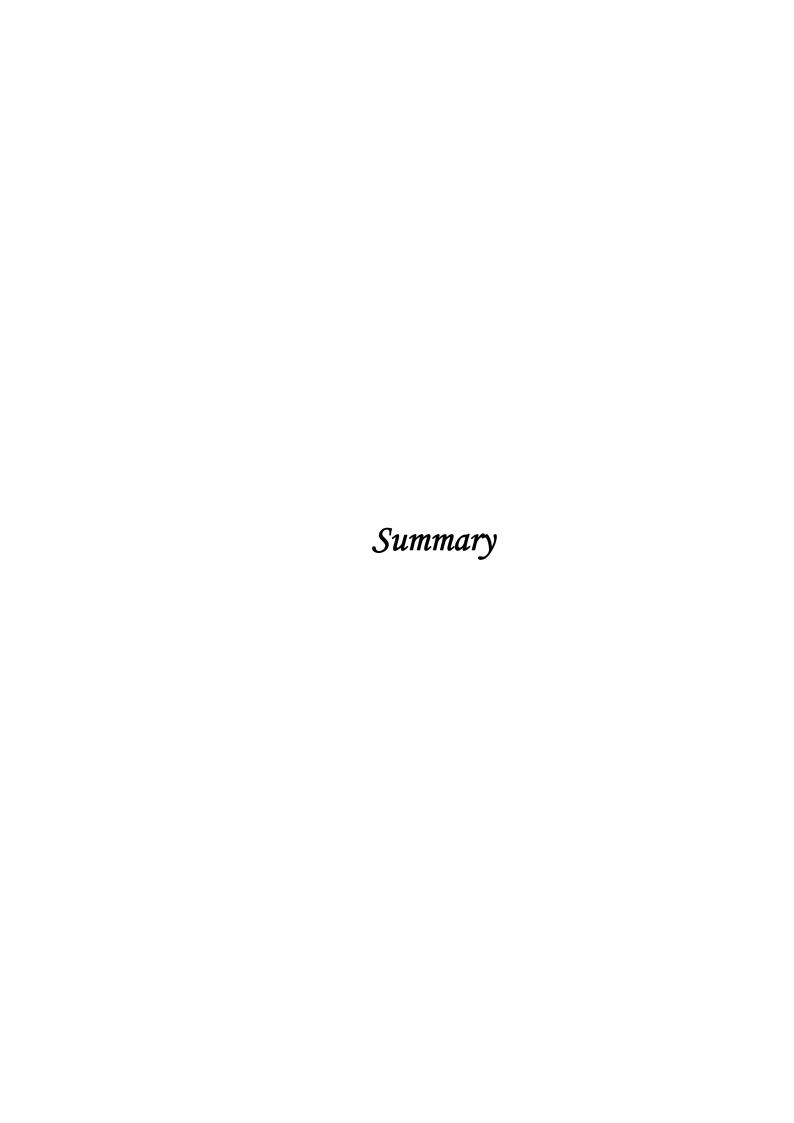












References



الملخص العربي

1- INTRODUCTION

Brucellosis is a major zoonotic disease of domestic and wild animals which is facultative intracellular pathogens that have the ability to survive and multiply in professional and non professional phagocytes and cause undulant fever in human. Manifested itself as a systemic febrile and illness, most human disease is caused by Brucella melitensis but Brucella abortus and Brucella suis are also highly pathogenic. The disease exists worldwide especially in the Mediterranean Basian, the Arabian peninsula, the Indian subcontinent, parts of Mexico and central and south America (Young 1999). This infection is considered to be a problem because Brucella abortus vaccines don't protect effectively against Brucella melitensis infection emerges as an increasingly serious public health problem in some countries (Corbel 1997).

The disease is recognized in more than 100 countries, with an estimated one million new cases per year, most cases occur as a result of occupational exposure to animal or ingestion of non pasteurized products. laboratory workers exposed to the agent are also at high risk of infection. Brucellosis can be acquired through ingestion and through breaks in the skin and aerosol transmission also occur (Buchanan et al.,1974).

Brucella is a cocco bacillus, gram negative, non sporing and non motile aerobic bacterium whose hosts are mostly animals (Alton et al.,1988).

The bacterium possesses an unconventional non endotoxic lipopolysacharide that confers resistance to antimicrobial attacks and modulates the host immune response.

Brucellosis affect both human and animals such as cattle, sheep, goats, swine and dogs (Xiang et al .,2006) wild life including rats are also susceptible and may play a role in transmission to domestic animals and humans (Moore et al.,(1981), (Monir and Deniss 2001), currently. There are six recognized species of Brucella based on phenotypic characteristics, antigenic variation and prevalence of infection in different animals hosts, Brucella abortus (cattle), Brucella canis (dogs), Brucella melitensis (goat& sheep) Brucella neotomae (desert wood rat), Brucella ovis (sheep), and Brucella suis (pigs,reindeer and hares) (corbel, 1997; Moreno et al., 2002). Recently, two Brucella strains from marine mammals have been reported (Bricker et al., 2000; Cloeckaert el al., 2000). And the names Brucella pinnipediae (Seal / otter) and Brucella cetaceae (Porpoise / whale) have been proposed (Cloeckaert et al., 2003).

In Egypt , brucellosis has been reported and recorded as early as 1939, however, attention was directed to the disease only during the 1960 . The incidence of brucellosis in cattle on some farms became very high , the disease was also reported in buffaloes , sheep , goat , swine ,camels , horses , donkeys , dogs , rats which cause major problem due to the economic losses. These losses , are due to abortion, drop in milk yield , Infertility as well as disturbance in breeding system beside its zoonotic importance.(Refai.,1988)

Brucella abortus has been isolated from rats and the rat infections occurs in areas with large numbers of infected cattles which suggests that the cattle are important source of infection for rats (Moore and Schnurrenberger.,1981).