

## LIST OF CONTENTS

	<b>P P</b>
1- Introduction	1
2-Review of Literature	4
2.1. Bovine Ephemeral Fever (BEF)	4
2.1.1 definition	4
2.1.2. Synonyms	5
2.1.3. History	6
2.1.3.1.In the world	6
2.1.3.2. In Egypt	13
2.1.4. Etiology	15
2.1.5. Antigenic relationship	18
2.1.5.1. Strain variation	18
2.1.5.2. Antigenic relationship with other Rhabdoviruses	19
2.1.5.3. Serotypes	20
2.1.6. Animal susceptibility	21
2.1.7. Epidemiology	23
2.1.7.1. Transmission	23
2.1.7.2. Pathogenesis	24
2.1.7. Clinical Symptoms	26
2.1.8. Post mortem findings	33
2.1.8. Immunity and vaccination	35
2.2. RABIES	44
2.2.1. Definition	44
2.2.2. History of rabies	45
2.2.3. Etiology	46
2.2.4. Clinical signs of rabies	47
2.2.5. Host susceptibility	49
2.2.6. Vaccination and control	50
2.3. Serum proteins and factors affecting them	52
3. Material and Methods	56
3.1. Materials	56
3.1.1- Animals	56
3.1.2. Vaccines	56

## II

3.1.2.1- Bovine ephemeral fever vaccines	56
3.1.2.2- Rabies vaccine	56
3.1.3- Live attenuated viruses	57
3.1.4- Cell culture	57
3.1.5- Cell culture media and solutions	57
3.1.5.1- Hank's balanced salt solution (HBSS)	57
3.1.5.2- Trypsine solution	57
3.1.5.3- Sodium bicarbonate solution	58
3.1.5.4. Antibiotic solution	58
3.1.5.5- New born calf serum	58
3.1.5.6-Cell culture media	58
3.1.6- Other chemicals	59
3.1.7-Reagents used in Enzyme Linked Immuno Sorbant Assay (ELISA)	59
3.1.8-Titration of the anti-bovine conjugate	60
3.2- Methods	61
3.2.1- Experimental design	61
3.2.2- Sampling	62
3.2.3- Serum inactivation	62
3.2.4. Serum neutralization test (SNT)	62
3.2.5. Cell culture passage	63
3.2.6 Preparation of BEF and rabies antigens	64
3.2.7. Indirect ELISA	64
3.2.7.1. Determination of working strength conjugate	64
3.2.7.2. Chekboard titration for determination of the optimal conditions of indirect ELISA	64
3.2.7.3. Tested antibody assay	65
3.2.8- Estimation of serum proteins	67
4-Results	68
Experiment No.1:  Vaccination of cattle with the cell culture live attenuated bovine ephemeral fever vaccine	68

Experiment No.2: Vaccination of cattle with inactivated cell culture bovine ephemeral fever vaccine	70
Experiment No-3: Vaccination of cattle with live attenuated cell culture BEF vaccine then boosting with the inactivated cell culture BEF vaccine	72
Experiment No-4: Vaccination of cattle with the inactivated cell culture BEF vaccine then boosting with live attenuated cell culture BEF vaccine	74
Experiment No-5: Vaccination of cattle with the inactivated cell culture rabies vaccine	76
Experiment No-6: Vaccination of cattle with the inactivated cell culture BEF vaccine then boosting with the inactivated cell culture rabies vaccine	78
Experiment No-7: Vaccination of cattle with the inactivated cell culture rabies vaccine then boosting with the inactivated cell culture BEF vaccine	82
Experiment No-8: Simultaneous vaccination of cattle with inactivated cell culture rabies vaccine and inactivated cell culture BEF vaccine	86
Experiment No-9: Estimation of serum proteins in the sera of vaccinated cattle groups	97
5-Discussion	100

IV

6-conclusion	108
7- summary	109
8- Referance	111
9- Arabic summary	

**LIST OF ABBREVIATIONS**

BEF	:	Bovine Ephemeral Fever
BEFV	:	Bovine Ephemeral Fever Virus
BHK-21	:	Baby Hamster Kidney cell line number-21
CPE	:	Cytopathic effect
DDW	:	Double distilled water
ELISA	:	Enzyme Linked Immuno Sorbant Assay
ERA	:	Evelyn-Rokitincki-Abeleseth strain of rabies virus
HBSS	:	Hank's balanced salt solution
IU	:	International unite
MEM	:	Minimum Essential Medium
OD	:	Optical density
PBS	:	Phosphate Buffer Saline
SNT	:	Serum neutralization test
TCID <sub>50</sub>	:	50% Tissue culture infective dose

## **7-SUMMARY**

Bovine ephemeral fever is a non-contagious arthropod-born viral disease affecting cattle and buffaloes causing great economic losses due to the sharp decrease in milk and meat production in addition to the expensive treatment trials. The disease is caused by a virus belongs to the family Rhabdoviridae; genus ephemero virus.

On the other side Rabies was known as one of the oldest dangerous viral disease affecting all warm blooded animals and human beings. It is also caused by a virus belongs to the family Rhabdoviridae but it is a member of the genus Lyssa virus and mainly transmitted through biting of a rabid animal to a susceptible host.

The location of the two viruses in the same family attracts the attention of researchers to do many studies to investigate the relationship between them especially in the immunogenic direction. So the present study was one of such studies which try to answer some questions about the possibility of vaccination of cattle with either bovine ephemeral fever or rabies vaccines or with both of them simultaneously or in a mutual manner. The obtained experimental results revealed that

- 1- Live attenuated BEF vaccine resulted in higher levels of antibodies than those resulted from the inactivated one.
- 2- Two doses of BEF inactivated vaccine induced good titers of BEF antibodies.

- 3- Giving a second dose of inactivated BEF vaccine after that of the live vaccine induced higher levels of antibodies than in the first and second cases.
- 4- A dose of live BEF vaccine after the inactivated one resulted in lower titers of antibodies than in the opposite case.
- 5- Rabies vaccination of cattle gives good protective levels of rabies antibodies in vaccinated cattle.
- 6- Mutual vaccination of cattle with inactivated rabies and BEF vaccines induced better immunity against the two viruses than in the case of single vaccination against each of them.
- 7- Estimation of serum proteins revealed that the applied vaccination schedule resulted in significant increase in the values of total serum protein due to the increase in serum globulin in vaccinated cattle than in the non vaccinated control animals.