سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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Immune Status of Pneumonic Calves

A Thesis Presented
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Dedication

To The Spirit of my Father

To my Mother

To my Wife

List of Abbreviations

Surfactant associated protein-A	SP-A
Surfactant associated protein -D	SP-D
Surfactant associated protein -C	SP-C
Lipopolysaccharide	LPS
Pulmonary surfactant	P.S.
Respiratory Distress Syndrome	RDS
Niacin adenine dinucleotide phosphate	NADPH
Interferon-gamma	INF-γ
Tissue necrosis factor	TNF-α
Polymorphonuclear cells	PMN
Triple sugar iron agar	TSI
Eosin methylene blue agar	EMB
Immunoglobulin	Ig
Nitric oxide	N.O.
Nitro blue tetrazolium	NBT
Oxygen free radical (super oxide anion)	O^-
Colony forming unit	CFU

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INTRODUCTION

Calves are one of the main sources of animal protein in most countries all over the world; therefore great attention was directed to calf industry to meet the increase in people demands.

The respiratory and the digestive systems of newly born calves appears to be most vulnerable. Pneumonia and diarrhoea frequently occur independently or together leads to high mortality rates varying between 27% up to 55% of the total deaths (**Morck et al. 1989).**

The respiratory diseases with subsequent pneumonia is one of the major problems which face the practicing veterinarians and at the same time threatens projects concerned with calf rearing and production.

In Egypt, pneumonia is the most cause of morbidity and mortality in newly born buffalo calves. The annual report of the Ministry of Agriculture of Egypt at 1986 revealed that out of 414 newly born calves born in a Governmental farm 193 died with a mortality rate of 46.8%. Meanwhile, 50% of deaths among calves below than 3 months old were attributed to pneumonia **(EL Battrawy, 1991).**

The etiology of pneumonia is complex and multifactorial which are either non-infectious or microbial determinants including bacteria, viruses, fungi, etc.

E. coli has been recognized as a component of the normal bacterial flora of the intestine of warm-blooded animals. In some certain conditions it becomes pathogenic and result in great losses in newly born calves due to pneumo-enteritis **(Garoia et al., 1982).**

Recently animal studies and clinical reports indicate that pulmonary surfactant dysfunction is involved in the patho-physiology of severe neonate pneumonia **(Rauprich et al., 2000).**

The pulmonary surfactant is a complex mixture of phospholipids and specific proteins that lines alveolar surface of the lung, its major function is to reduce surface tension **(King and Clements, 1972 a).**

In the last few years, investigations revealed that pulmonary surfactant of some species as humans, rats, bovine and sheep have immunological properties and play an important role in lung immune defense mechanism **(Van Golde, 1995).**

One of these roles is the effect on phagocytic cells such as neutrophils and macrophages.

Macrophages play important role in defense mechanism against infection as macrophages are considered the first cellular elements that non-specifically engulf foreign pathogens (**Nathan et al., 1982).** Moreover, they are able to kill the microorganisms through production of certain reactive radicals such as nitric oxide and super oxide anion **(Markus et al., 1993).**

Nitric oxide acts as intracellular signaling molecule or as neurotransmitter when produced in low quantities. When is produced in higher quantities for extended periods it kills microorganisms and tumor cells.

Nowadays, nitric oxide was identified as the effector molecule in killing a wide range of intra- and extra-cellular pathogens **(Schmidt and Walter, 1994).**

Another bactericidal radical is super oxide anion which produced through respiratory burst mechanism of immune cells. The oxygen free radicals are considered as a potent bactericidal agent against microorganisms **(Martinez et al., 2000).**

Therefore the aim of the present study was :-

1- To isolate pathogenic bacteria from pneumonic buffalo calves with special concerning to *E. coli* infection.

2-To throw some light on the immunostimulant and bactericidal action of buffalo's pulmonary surfactant through

A- Bactericidal test

B- Phagocytic activity assay

C- Nitric oxide production assay.

D- Super oxide production assay.

3- To study the relationship between the microorganisms, pulmonary surfactant and the cellular elements of immune system.