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IMMUNOLOGICAL STUDY ON DIFFERENT FORMULAE OF CONCENTRATED PNEUMO-4 VACCINE

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Contents

1.	**INTRODUCTION**	1
2.	**REVIEW OF LITERATURE**	5
2.1.	**HISTORICAL PERSPECTIVES:**	5
2.1.1.	**IN WORLD:**	5
2.1.2.	**IN EGYPT:**	9
2.2.	**CLASSIFICATION**	14
2.3.	**GENERAL PROPERTIES:**	17
2.3.1.	**MORPHOLOGICAL STRUCTURE:**	17
2.3.2.	**GENOME STRUCTURE AND ORGANIZATION:**	20
2.3.3.	**PROTEIN STRUCTURE AND FUNCTION:**	25
2.4.	**PHYSICO-CHEMICAL PROPERTIES:**	30
2.5.	**BIOLOGICAL PROPERTIES:**	34
2.5.1.	**VIRUS MULTIPLICATION CYCLE:**	34
2.5.2.	**CULTIVATION ON CELL CULTURE:**	40
2.6.	**ANTIGENIC PROPERTIES AND STRAIN VARIATION:**	45
2.7.	**HOST SUSCEPTIBILITY:**	51
2.8.	**PATHOGENICITY OF THE VIRUS:**	54
2.9.	**IMMUNITY**	57
2.10.	**VACCINATION**	63
2.10.1.	**MONOVALENT VACCINES:**	63
2.10.2.	**MULTIVALENT VACCINES:**	66
2.11.	**ADJUVANTS:**	69
2.11.1.	**Oil Adjuvants:**	69
2.11.2.	**ALUMINUM HYDROXIDE GEL ADJUVANT**	73
2.12.	**VIRUS PURIFICATION AND CONCENTRATION:**	74
3.	**MATERIALS AND METHODS**	75
3.1.	**MATERIALS**	75
3.1.1.	**VIRUS STRAINS:**	75
3.1.2.	**COMMERCIAL UNCONCENTRATED INACTIVATED PNUMO-4 VACCINE:**	75
3.1.3.	**ANIMALS:**	76
3.1.4.	**SAMPLING:**	76
3.1.5.	**REFERENCE HYPER-IMMUNE SERA:**	76
3.1.6.	**TISSUE CULTURE:**	77
3.1.7.	**TISSUE CULTURE MEDIA AND SOLUTIONS:**	77
3.1.7.1.	**MINIMUM ESSENTIAL MEDIUM (MEM):**	77

3.1.7.2.	**NEWBORN CALF SERUM:**	77
3.1.7.3.	**TRYPSIN SOLUTION (0.25%):**	77
3.1.7.4.	**TRYPSIN-VERSENE SOLUTION:**	78
3.1.7.5.	**HANK'S BALANCED SALT SOLUTION (HBSS):**	78
3.1.7.6.	**STOCK ANTIBIOTIC SOLUTION:**	78
3.1.7.7.	**SODIUM BICARBONATE SOLUTION (4.4%):**	79
3.1.8.	**POLYETHYLENE GLYCOL (PEG 6000):**	79
3.1.9.	**TRIS KCL (ELUTION BUFFER):**	79
3.1.10.	**INACTIVANT:**	79
3.1.11.	**SODIUM THIOSULPHATE:**	80
3.1.12.	**THIOMERSAL POWDER:**	80
3.1.13.	**ADJUVANTS:**	80
3.1.14.	**PHOSPHATE BUFFER SALINE:**	81
3.1.15.	**BUFFER USED IN ENZYME LINKED IMMUNO-SORBANT ASSAY (ELISA)**	81
3.1.15.1.	**COATING BUFFER (CARBONATE – BICARBONATE BUFFER, PH 9.6):**	81
3.1.15.2.	**WASHING BUFFER (PBS + TWEEN 20):**	81
3.1.15.3.	**BLOCKING BUFFER (PBS + BOVINE SERUM ALBUMIN):**	82
3.1.15.4.	**DILUENT BUFFER FOR CONJUGATE AND SERUM SAMPLES:**	82
3.1.15.5.	**PHOSPHATE CITRATE BUFFER (PH5):**	82
3.1.15.6.	**SUBSTRATE (ORTHOPHENYL DIAMINE (OPD):**	82
3.1.15.7.	**HYDROGEN PEROXIDE (H_2O_2) 30%:**	82
3.1.15.8.	**STOPPING SOLUTION:**	82
3.1.16.	**CONJUGATE:**	83
3.1.17.	**PLATES:**	83
3.1.18.	**CRYSTAL VIOLET STAIN:**	83
3.2.	**METHODS**	83
3.2.1.	**VIRUS PROPAGATION:**	83
3.2.2.	**VIRUS TITRATION:**	84
3.2.3.	**VIRUS IDENTIFICATION**	84
3.2.4.	**CONCENTRATION OF VIRUSES WITH PEG:**	84
3.2.5.	**INACTIVATION OF VIRUSES USING 2-BROMOETHYLENEIMINE HYDROBROMIDE (Binary Ethylene Imine) (BEI):**	85
3.2.6.	**TEST FOR INACTIVATION:**	85
3.2.7.	**PREPARATION OF CONCENTRATED INACTIVATED COMBINED (PNEUMO-4) VACCINES:**	85
3.2.8.	**QUALITY CONTROL OF THE PREPARED VACCINE:**	86
3.2.8.1.	**STERILITY TEST:**	86

3.2.8.2.	**SAFETY TEST:**	86
3.2.9.	**EXPERIMENTAL DESIGN FOR EVALUATION OF HUMORAL IMMUNE RESPONSE FOR THE PREPARED CONCENTRATED INACTIVATED VACCINES COMPARED WITH COMMERCIAL UNCONCENTRATED ONE:**	87
3.2.10.	**SEROLOGICAL TESTS:**	88
3.2.10.1.	**SERUM NEUTRALIZATION TEST:**	88
3.2.10.2.	**ENZYME LINKED IMMUNO-SORBENT ASSAY (ELISA):**	89
4.	**RESULTS**	92
4.1.	**PROPAGATION OF BVD, BOHV-1, PI-3 AND BRS VIRUSES ON MDBK CELL LINE:**	92
4.2.	**TITRATION OF BVD, BoHV-1, PI-3 AND BRS VIRUSES ON MDBK CELL LINE:**	95
4.3.	**QUALITY CONTROL TESTS OF THE PREPARED CONCENTRATED INACTIVATED PNEUMO-4 VACCINES:**	96
4.3.1.	**STERILITY TEST:**	96
4.3.2.	**SAFETY TEST:**	96
4.3.3.	**EVALUATION OF HUMORAL IMMUNE RESPONSE IN LABORATORY CALVES:**	97
4.3.3.1.	**ANTIBODY RESPONSE OF VACCINATED CALVES WITH DIFFERENT DOSES OF THE PREPARED CONCENTRATED INACTIVATED PNEUMO-4 AND COMMERCIAL VACCINES AGAINST BVDV:**	97
4.3.3.2.	**ANTIBODY RESPONSE OF VACCINATED CALVES WITH DIFFERENT DOSES OF THE PREPARED CONCENTRATED INACTIVATED PNEUMO-4 AND COMMERCIAL VACCINES AGAINST BoHV-1:**	101
4.3.3.3.	**ANTIBODY RESPONSE OF VACCINATED CALVES WITH DIFFERENT DOSES OF THE PREPARED CONCENTRATED INACTIVATED PNEUMO-4 AND COMMERCIAL VACCINES AGAINST PI-3V:**	104
4.3.3.4.	**ANTIBODY RESPONSE OF VACCINATED CALVES WITH DIFFERENT DOSES OF THE PREPARED CONCENTRATED INACTIVATED PNEUMO-4 AND COMMERCIAL VACCINES AGAINST BRSV:**	107
4.3.4.	**FIELD EVALUATION:**	110
4.3.4.1.	**SNT FOR ESTIMATING THE IMMUNE RESPONSE:**	110
4.3.4.2.	**THE ELISA TEST FOR ESTIMATING THE IMMUNE RESPONSE**	116
4.3.4.3.	**SNT FOR ESTIMATING THE IMMUNE-RESPONSE:**	122
4.3.4.4.	**THE ELISA TEST FOR ESTIMATING THE IMMUNE RESPONSE**	128
5.	**DISCUSSION**	134
6.	**SUMMARY**	140
7.	**CONCLUSIONS**	142
8.	**REFERENCES**	143
الملخص العربى		195

LIST OF TABLES

Table	Title	Page
(1)	Characteristic CPE of BVD, BoHV-1 PI-3 and BRS Viruses on MDBK cell line	77
(2)	Titration of BVD, BoHV-1, PI-3 and BRS Viruses on MDBK cell line	80
(3)	Results of sterility test of the prepared concentrated inactivated pneumo-4 viruses' vaccines.	81
(4)	Results of safety test of the prepared inactivated pneumo-4 viruses' vaccines.	82
(5)	Mean neutralizing BVD antibody titer in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one	84
(6)	Mean ELISA BVDV values expressed as OD in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one	85
(7)	Mean neutralizing BoHV-1 antibody titer in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	87
(8)	Mean ELISA BoHV-1 values expressed as OD in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	88
(9)	Mean neutralizing PI-3V antibody titer in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	90
(10)	Mean ELISA PI-3V values expressed as OD in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	91
(11)	Mean neutralizing BRSV antibody titer in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	93
(12)	Mean ELISA BRSV values expressed as OD in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	94

(13)	Mean neutralizing BVDV antibody titer in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	96
(14)	Mean neutralizing BoHV-1 antibody titer in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	97
(15)	Mean neutralizing PI-3 antibody titer in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	98
(16)	Mean neutralizing BRSV antibody titer in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	99
(17)	Mean neutralizing antibody titer for BVD, BoHV-1, PI-3, and BRS viruses in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	100
(18)	Mean ELISA BVDV values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm	101
(19)	Mean ELISA BoHV-1 values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm	102
(20)	Mean ELISA PI-3V values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm	103
(21)	Mean ELISA BRSV values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	104
(22)	Mean ELISA BVDV, BoHV-1, PI-3V and BRSV values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	105
(23)	Mean neutralizing BVDV antibody titer in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	106
(24)	Mean neutralizing BoHV-1 antibody titer in sera of calves vaccinated concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	107

(25)	Mean neutralizing PI-3V antibody titer in sera of calves vaccinated concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	108
(26)	Mean neutralizing BRSV antibody titer in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	109
(27)	Mean neutralizing antibody titer for BVD, BoHV-1, PI-3, and BRS viruses in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	110
(28)	Mean ELISA BVDV values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in in El-Beni-suif farm.	111
(29)	Mean ELISA BoHV-1 values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in in El-Beni- suif farm.	112
(30)	Mean ELISA PI-3V values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in in El-Beni-suif farm.	113
(31)	Mean ELISA BRSV values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in in El-Beni-suif farm.	114
(32)	Mean ELISA BVDV, BoHV-1, PI-3V and BRSV values expressed as OD in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-suif farm.	115

LIST OF FIGURES

Figure	Title	Page
(1)	Normal MDBK cells	78
(2)	CPE of BVDV	78
(3)	CPE of BoHV-1	79
(4)	CPE of PI-3V	79
(5)	CPE of BRSV	80
(6)	The level of neutralizing BVDV antibody titers in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	84
(7)	The level of ELISA BVDV values in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	85
(8)	The level of neutralizing BoHV-1 antibody titers in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccine compared with commercial unconcentrated one.	87
(9)	The level of ELISA BoHV-1 valuesin sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	88
(10)	The level of neutralizing PI-3V antibody titers in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	90
(11)	The level of ELISA PI-3V valuesin sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	91
(12)	The level of neutralizing BRSV antibody titers in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	93
(13)	The level of ELISA BRSV values in sera of calves vaccinated with different doses of concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one.	94

(14)	The level of neutralizing BVDV antibody titers in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	96
(15)	The level of neutralizing BoHV-1 antibody titers in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	97
(16)	The level of neutralizing PI-3V antibody titers in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	98
(17)	The level of neutralizing BRSV antibody titers in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	99
(18)	The level of ELISA BVDV values in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one. El-Salhya farm.	101
(19)	The level of ELISA BoHV-1 values in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one. El-Salhya farm.	102
(20)	The level of ELISA PI-3V values in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	103
(21)	The level of ELISA BRSV values in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in El-Salhya farm.	104
(22)	The level of neutralizing BVDV1 antibody titers in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	106
(23)	The level of neutralizing BoHV-1 antibody titers in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	107
(24)	The level of neutralizing PI-3V antibody titers in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	108
(25)	The level of neutralizing BRSV antibody titers in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	109

(26)	The level of ELISA BVDV values in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	111
(27)	The level of ELISA BoHV-1 values in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	112
(28)	The level of ELISA PI-3V values in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	113
(29)	The level of ELISA BRSV values in sera of calves vaccinated with concentrated inactivated pneumo-4 vaccines compared with commercial unconcentrated one in Beni-Suif farm.	114

6. SUMMARY

Bovine respiratory diseases have a great economic importance in feedlot cattle due to high morbidity rate and losses of calves caused by them. Bovine respiratory viruses like BVD, BoHV-1, PI-3 & BRS viruses consider the most incriminated in Pneumo enteritis syndrome so production of a vaccine containing these viruses is a must to control this problem.

Our present study aimed for preparation of potent PEG concentrated combined inactivated viruses vaccine containing BVD, BoHV-1, PI-3, & BRS viruses(pneumo-4) by using two types of adjuvants (Montanide oil ISA 206 & Aluminum hydroxide gel) followed by evaluation of humeral immune response in calves compared with the commercial un concentrated vaccine and estimating the proper protective dose for each vaccine.

The applied experiment revealed that:

All viruses were successfully propagated on MBDK cell culture inducing cytopathic effects (72 h for BVD & BRS, and 24-36 h for BoHV-1 & 48 h for PI-3) post inoculation.

The highest viruses' titer obtained was 6 $\log_{10}$ $TCID_{50}$/ml for BVD and BRS viruses, and 8 $\log_{10}$ $TCID_{50}$/ml for BoHV-1 and PI-3 viruses.

All viruses were concentrated separately by using PEG 6000 then inactivated by BEI then used in preparation of the two vaccines, one by using Montanide oil ISA 206, and the other by using Aluminum hydroxide gel as adjuvants.

The prepared concentrated inactivated Pneumo-4 vaccines were found to be free from foreign contaminants; did not induce any clinical abnormalities or deaths among inoculated mice. As well as neither elevation of body temperature nor appearance of any clinical abnormalities reported in calves during 21 days of observation.

Evaluation of the prepared vaccines by vaccination of calves with different doses from each vaccine (2 ml, 2.5 ml& 3 ml from concentrated inactivated pneumo-4 gel vaccine) & (2.5 ml, 3 ml, & 3.5 ml from concentrated inactivated pneumo-4 oil vaccine) in three groups of calves (6 months age) per each vaccine. Comparing with another group injected with 5ml of the commercial unconcentrated vaccine. That occurred by giving 2 injections of each vaccine with 2 weeks interval by intramuscular route. Another group of calves was left as control till the end of the experiment.

Monitoring of the induced immunity in vaccinated calves with the prepared concentrated inactivated Pneumo-4 vaccines; it was found that SNT and ELISA tests revealed that the vaccine was able to induce detectable levels of specific BVD, BoHV-1, PI-3 & BRS viruses' antibodies by the 2nd wpv. These antibodies were increased to reach a maximum titer on 2 mpv for the concentrated inactivated pneumo-4 gel adjuvanted vaccine then remain protective till 7 mpv for all viruses contained in the vaccine and reach the maximum level on 3 mpv for concentrated inactivated pneumo-4 oil adjuvanted vaccine and remained protective more than 9 mpv.

Also It was noticed that the groups of calves vaccinated with 2.5ml or 3ml of gel vaccine mostly gave the same immune response but higher than that given 2ml of the gel vaccine, while the calves vaccinated with 3 ml & 3.5 ml of oil vaccine gave the same immune response but also higher than 2.5 ml in the titer and duration comparing with the group vaccinated with commercial vaccine and unvaccinated control group.

The prepared vaccines were applied in field in 2 different farms, by using the dose 2.5ml &3ml from the concentrated inactivated gel &oil adjuvanted pneumo-4 vaccines respectively as they gave almost the same effect of the immune response and its duration of the largest dose (3ml &3.5ml). The result proved the efficacy of the prepared vaccines to induce high immune response especially in oil adjuvanted vaccine which persist high till the end of experiment.