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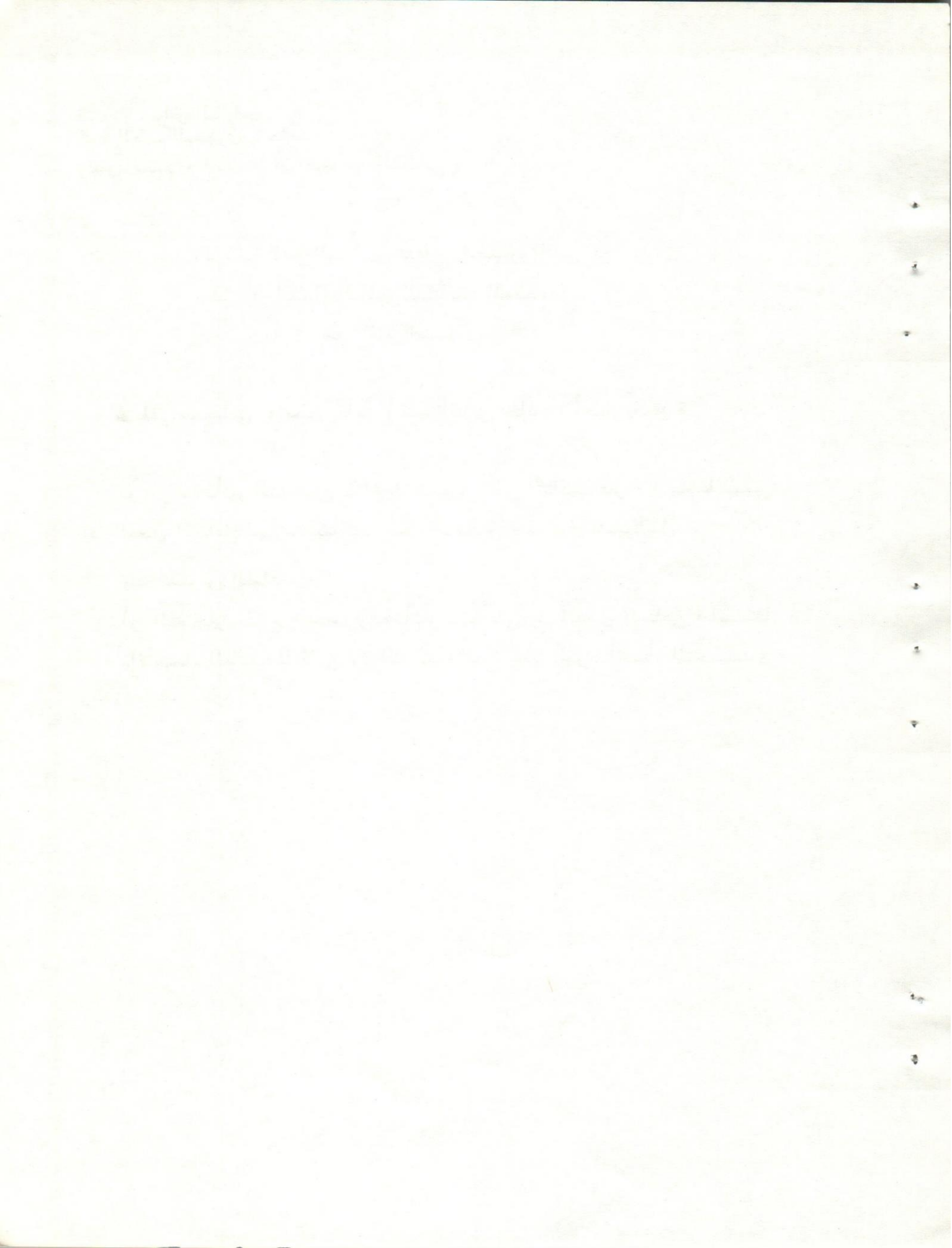
دراسة تأثير التحصين بـلقاح الحمبورو الحى  
على رد الفعل المناعى للكتاكيت المحصنة :-  
ضد النيوكاسل

مصطفى بسطامى ، محمد عامر ، ضياء الدين جاد ، أحمد حمودة

تم دراسة تأثير التحصين بـلقاح الحمبورو الحى لكتاكيت عمر ١٢ يوم على  
رد الفعل المناعى لهذه الكتاكيت عند التحصين ضد مرض النيوكاسل .

وقد ثبت من النتائج :

أن التحصين بـلقاح الحمبورو له تأثير مشبط على رد الفعل المناعى قياسا  
بالأجسام المانعة للتلازن وكذلك نسبة الصد عند إجراء اختبار التحدى



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**EFFECT OF LIVE GUMBORO DISEASE VIRUS VACCINE ON THE IMMUNE  
RESPONSE OF CHICKENS TO NEWCASTLE DISEASE VACCINATION**  
(With One Table)

By  
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**SUMMARY**

The effect of live Gumboro disease virus vaccination of 12 day-old chicks on their immune response to Newcastle disease vaccines was studied. The gumboro disease vaccinal virus had a suppressive effect on the immune response of chicks as measured by haemagglutinating inhibiting antibody titres and the protection rate using the challenge test. It can be concluded that the live Gumboro vaccinal virus has an immunosuppressive effect on the immune response of chicks to Newcastle vaccines.

**INTRODUCTION**

It was observed for several times that the infection with Gumboro disease virus had immunosuppressive effect on the chick's immune response to other viral or bacterial diseases (ALLAN, *et al.* 1972; FARAGHER, *et al.* 1972 & 1974 and BIDIN, *et al.* 1981). The immunosuppressive effect of living vaccinal strain of Gumboro disease was recorded by THORNTON and PATTISON (1975) and to be correlated with the degree of bursal damage, MALLICK (1978) and REECE, *et al.* (1982) reported that the immunity to Newcastle disease was suppressed to severe extent in chicks vaccinated with living Gumboro vaccine. Moreover EDWARDS, *et al.* (1982) reported the depressive effect of the Gumboro vaccine on the chicks immune response to Brucella Abortus S 19 which was lasted for 4 weeks. On the other hand no effect for the living Gumboro vaccinal virus on the chicks immune response to other vaccines could be detected by LOMBARDI, 1974; VIELITZ and LANDGRAF, 1976.

This investigation was carried out to study the effect of live Gumboro disease virus vaccine on the immune response of chicks to Newcastle disease vaccines.

**MATERIAL and METHODS**

**1) Embryonated chicken eggs:**

Commercial fertile chicken eggs were used in this experiment.

**2) Experimental chicks:**

One hundred cross breed (Hubbard) as one day-old chicks were used.



**3) Challenge Virus:**

A velogenic viscerotropic Newcastle disease virus local strain identified by SHEBLE and REDA, 1976 was used.

**4) Vaccinal viruses:**

Newcastle disease Hitchner B<sub>1</sub> (TAD, Lot. No. 285.1) containing EID<sub>50</sub> of 10<sup>8.89</sup> /ml was used for ocular vaccination, while La Sota vaccine (TAD, Lot. No. 587.1) with 10<sup>9</sup> EID<sub>50</sub> /ml was used for drinking water vaccination. Live Gumboro vaccine (TAD, Lot. No. 187) with EID<sub>50</sub> of 10<sup>5</sup> /ml was used in drinking water vaccination.

**5) Determination of virus infectivity:**

Titration of the used vaccines and challenge virus before use was carried out according to ANON (1971), while the EID<sub>50</sub> was calculated according to REED and MUENCH (1938).

**6) Haemagglutination inhibition (HI) test:**

The B-procedure of the HI-test was employed using the micromethodology according to TAKATSY (1956).

**7) Challenge test:**

A challenge dose of 10<sup>6</sup> EID<sub>50</sub> per bird was intramuscularly injected. The challenged birds were observed daily for symptoms and/or mortalities for 3 weeks. Birds with symptoms and survived till the end of the observation period were considered as if dead.

### **EXPERIMENTAL DESIGN**

The used chicks were divided from the 1st day into four equal groups; 25 chicks each. The groups were treated as follows:

- a) Group 1 was vaccinated with Hitchner B<sub>1</sub> (Ocular instillation) at 7 days of life, Gumboro (Drinking water) at 12 days of age, and La Sota (Drinking water) at 21 days of age.
- b) Group 2 was vaccinated with Hitchner B<sub>1</sub> and La Sota vaccines at the same ages as in group one.
- c) Group 3 was vaccinated only against Gumboro disease at 12 days of age.
- d) Group 4 was left as non vaccinated negative control.

Individual blood samples were collected from all groups at the 14th, 21st, 28th, 35th and 42th days of age. The collected sera were subjected to HI-test for detection of HI antibody titres against Newcastle disease.

At the age of 42 days, chicks of all groups were challenged with the virulent Newcastle virus and kept under observation for 3 weeks. The obtained results are shown in table 1.

### **RESULTS**

Results in table (1) showed that:

**a) HI-titres:**

Chicks vaccinated against both Newcastle and Gumboro diseases (Group 1) showed lower geometric means of HI-titres than those vaccinated against Newcastle disease only (Group 2). Birds vaccinated only against Gumboro (Group 3) and the nonvaccinated negative control (Group 4) showed undetectable HI-titres from the 28th day of life.

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## b) Protection rates

The protection rate to challenge test was higher (52%) in group 2 than that of group 1 (25%), while the Gumboro vaccinated group (3) showed 0% protection and the nonvaccinated group showed 8% protection.

Table (1)  
Results of Haemagglutination inhibition (HI) and challenge (Protection rate) tests in chicks after vaccination against Newcastle disease and/or Gumboro disease

Group No.	Geometric mean of HI-titres					Protection rate
	Age in days					
	14	21	28	35	42	
1	2.10	3.20	1.40	0.0	1.57	25.0
2	2.75	3.80	1.90	2.10	2.80	52.0
3	2.20	1.80	0.0	0.0	0.0	00.0
4	2.50	1.85	0.0	0.0	0.0	8.0

## DISCUSSION

It was clear from the obtained results that vaccination against Gumboro disease on the 12<sup>th</sup> day of age using the living virus vaccine depressed the immune response of the experimental chicks to Newcastle disease vaccination. This was pointed from the lower HI-geometric means and protection rate obtained from chicks vaccinated against Newcastle and Gumboro as compared with those vaccinated only against Newcastle disease as well as the protection rate obtained from the non-vaccinated control as compared with the Gumboro vaccinated gr. 3.

These results agreed with those reported by THORNTON and PATTISON (1975); MALLICK (1978); EDWARD'S, *et al.* (1982) and REECE, *et al.* (1982) who mentioned that living vaccinal strain of Gumboro disease virus had immunosuppressive effect on the chicken immune response to other poultry vaccines. While our results disagreed with those reported by LOMBARDI (1974) and VIELITZ and LANDGRAF (1976) who stated that living vaccinal virus strain of Gumboro disease had no immunosuppressive effect on the chicks immune response.

It can be concluded that vaccination against Gumboro disease at the 12<sup>th</sup> day of age using living virus vaccine lowered the immune response of chicks to Newcastle disease vaccines given at the early weeks of life.



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