OBSERVATIONS ON THE USE OF KOMAROV STRAIN OF NEWCASTLE DISEASE VACCINE IN THE SUDAN

M. A. GAFFAR ELAMIN1, A. I. KHALAFALLA2 and S. M. AHMED3

1,2 Veterinary Research Administration, Soba, PO Box 8067, Khartoum, Sudan; 3 The Arab Company for Livestock Development, Khartoum

SUMMARY

Broilers at 18 days old were vaccinated with a single dose of the K strain of Newcastle disease vaccine administered by different routes. The serological results obtained by haemagglutination inhibition at weekly intervals post-vaccination showed that birds vaccinated intranasally (i/n) or intramuscularly (i/m) had antibody titres higher than those vaccinated by the oral method.

Furthermore, when challenged 3 weeks after vaccination, those broilers vaccinated i/n or i/m had 75% and 70% resistance respectively, while those vaccinated by the oral or spray methods failed to withstand the challenge.

INTRODUCTION

Newcastle disease (ND) constitutes a major hazard to poultry in the Sudan, but little attention has been given to the study of this disease and especially vaccination against it.

The first vaccination against ND in the Sudan was performed in 1951 with vaccine imported from South Africa (Anon, 1951).

The Komarov (K) strain of ND vaccine has been recognised by the Sudan veterinary authorities since 1958 as the appropriate vaccine for control and is gradually being more widely used (Karrar and Mustafa, 1964).

However, recent complaints about the use of this vaccine have been expressed. One is that its administration to chicks at 4 weeks of age subjects them to the risk of infection before they are vaccinated. However, Haroun and Hajer (1989) showed that K vaccine can be used safely to vaccinate chickens at 21 days of age. Another criticism is that the usual method for administration is by intranasal drops which is satisfactory for small but not large flocks.

The present communication describes a trial of various routes for the administration of K vaccine to broiler chicks and the resulting protection against ND.

MATERIALS AND METHODS

Chickens

Lohmann broiler chicks were used in these experiments. These originated from parent stock reared at the Arab Company for Livestock Development (Acolid) farm, south of Khartoum. The parent stock had been vaccinated with Hitchner strain at day-old and with Lasota strain at 2 and 6 weeks of age. Both vaccines were administered in the drinking water.

The vaccine

Komarov strain ND vaccine was used in these experiments. The origin and production protocols for this vaccine have been described by Ali (1978).

Haemagglutination inhibition (HI) test

Blood was collected from the hearts of birds using 2 ml syringes. The blood was
Table I

ND maternal antibody titre (log 2) in broilers tested by haemagglutination inhibition (HI) at weekly intervals following vaccination of parents as described in the text.

<table>
<thead>
<tr>
<th>One-day old</th>
<th>One-week old</th>
<th>2-weeks old</th>
<th>3-weeks old</th>
</tr>
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<tr>
<td>&lt;1 4 5 4</td>
<td>3 3 2 2</td>
<td>2 1 2 2</td>
<td>&lt;1 1 2 1</td>
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<tr>
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<td>4 2 3 2</td>
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<td>NT 3 2 &lt;1</td>
<td>&lt;1 1 &lt;1 NT</td>
<td>&lt;1 2 1 &lt;1</td>
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...withdrawn after vaccination or immediately after hatching (Table I). The serum was stored in bijou bottles at -20°C until used. The HI test was conducted as described by Allan et al. (1978).

Experimental design

Two hundred and fifty two-week old broilers were divided into 5 groups each of 50 birds. Four groups were vaccinated at 18 days old and the fifth group was left as an unvaccinated control. All groups were then bled at weekly intervals. The vaccine protocol applied to each group was as follows:

- **Group I**
  - Received the vaccine as a spray as described by Westbury et al. (1984). The vaccine was calculated to contain $10^7$ ELD (embryo lethal doses) $s_0$/ml.

- **Group II**
  - Received the vaccine by nasal drops, using 400 doses diluted in 20 ml of physiological saline. Each bird received 0.25 ml vaccine containing $10^7$ ELD$S_0$/ml.

- **Group III**
  - Received the vaccine intramuscularly using 100 doses diluted in 5 ml physiological saline and each bird was given 0.25 ml of vaccine containing $10^7$ ELD$S_0$/ml.

- **Group IV**
  - Received the vaccine in the drinking water; the method was the same as described by Westbury (1984).

- **Group V**
  - Received no vaccine.

Birds from each vaccinated group and the control group were challenged 3 weeks after vaccination with the virulent Herts strain containing $10^5$ ELD$S_0$ in 0.1 ml given intramuscularly. Challenged birds were housed separately and observed for clinical signs and death.

**RESULTS**

**Experiment I. Newcastle disease maternal antibodies**

Table I shows that ND maternal antibodies demonstrated by the HI test in one day old and one week old broilers were higher than at 2 weeks old, while at 3 weeks of age the HI titres were very low or not detected.

**Experiment II. Newcastle disease antibodies in broilers following vaccination with the K strain**

The development of HI antibodies in broilers after vaccination administered by