

**BIOCHEMICAL STUDIES ON THE BLOOD OF
CATTLE
VACCINATED WITH MYCOPLASMA
MYCOIDES**

BY

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Introduction

Contagious bovine pleuro-pneumonia is an endemic disease in the Sudan. One method of its control is vaccination. The vaccine used is prepared in the department of Mycoplasma, Central Vet. Research Laboratories, Khartoum. It is prepared from *Mycoplasma mycoides* variety *mycoides*.

This study was conducted to investigate whether vaccination with this vaccine has any adverse reaction on the general health of the vaccinated animals.

Materials & Methods

Sixteen clinically healthy Butana calves about two years of age were used in this experiment. Four of these were kept unvaccinated as controls. The rest were injected S/C on the neck region with one milliliter of the prepared vaccine. All the animals were fed berseem and hay and water was given *ad libitum*.

Blood was collected from the jugular vein and divided into two portions. To one portion EDTA (Ethylene-Diamine Tetra-Acetic acid) was added. The other portion, without EDTA, was kept slanted overnight. The serum was separated by centrifugation and stored at -20°C until analysed.

Sampling was done before the experiment and thereafter twice, a week, once a week and later monthly. Body temperature was taken daily.

In the whole blood portion, the following parameters were determined:

- Haemoglobin (Hb) was determined colorimetrically as cyanmethaemoglobin.
- Packed cells volume (PCV) was done using a Hawksley microhaematocrit centrifuge.
- Red and White blood cells (RBC & WBC respectively) counts were done using improved

Neubauer Haemocytometer (Hawksley and Sons, Ltd. England).

The serum was analysed for :

- Total protein (T.P.) was determined by Biuret Method according to King, (1964).
- Albumin was done according to Bartholomew & Delaney, (1964).
- The globulin was calculated as the difference between the T.P. and albumin concentrations.
- Sodium (Na), and potassium (K) were analysed by flame photometry (Evans Electro-selenium, Ltd.) as described by Varley, (1969).
- Magnesium (Mg) was determined according to Spare, (1962).
- Inorganic phosphates (IP) was analysed by the method of Varley, (1969).
- Copper (Cu) was estimated by atomic absorption (Pye Unicam, Ltd., model SP 191).
- Iron (Fe) was done according to Trinder, (1956).
- Alanine and Aspartate aminotransferases (GPT & GOT respectively) were measured by the method of Reitman and Frankel (1957).
- Alkaline phosphatase (A.P.) was measured by the method of Kind and Knig (1954).
- The immune response after vaccination was detected by Complement Fixation (C.F.) test.

Results

The results (Fig 1 through Fig 4) showed that, except for WBC counts and globulin concentrations, which were significantly ($p < 0.05$) high in the experimental group, the rest of the parameters studied were not significantly ($p > 0.05$) different from the control group.

The study of the immune response Fig 4 after vaccination indicated that C. F. antibodies started to appear after one week of inoculation and maintained their high level to the end of the experiment.

It was noticed that rectal temperature was high in the experimental group during the first week of the experiment.

Discussion

Surveying the literature, we were not able to find any report about the possible effects of vaccination on the physiology of the vaccinated animals.

The parameters selected in this study may, in our opinion, be used as a surveillance tool for detecting the clinical status of the animal.

The results indicated that the experimental animals were clinically healthy. The rise in globulin concentration and WBC counts taken with the immune response may indicate that the animals were generating the antibodies against the given vaccine, and by the end of the experiment, the animals became totally immuned. The rise in temperature during the first week of vaccination was a natural reaction of the body to the inoculated vaccine.

Summary

Sixteen clinically healthy Butana calves about two years of age were used to investigate the possible reaction of *Mycoplasma mycoides* variety *mycoides* vaccine on the health of these animals. Four calves were kept unvaccinated as controls and the rest were inoculated S/C on the neck with one millimeter of the vaccine.

The whole blood was analysed for Hb, PCV, RBC, & WBC. Serum was analysed for T.P., albumin, globulin, bilirubin, Na, K, Mg, IP, Cu, Fe, and GOT, GPT, and alkaline phosphatase enzymes and the immune response detected by C.T. test. Body temperature was recorded daily.

The results showed that among the parameters studied, only globulin, and WBC values were significantly high ($P < 0.05$), in the experimental group. Moreover, the animals showed a rise in antibodies starting from the first week and maintained a high level to the end of the experiment.

It was noticed that the body temperature of the experimental animals was high during the first week of the experiment.

According to these results, it may be concluded that vaccination with *Mycoplasma mycoides* variety *mycoides* has no adverse reaction on the general health of the vaccinated calves.

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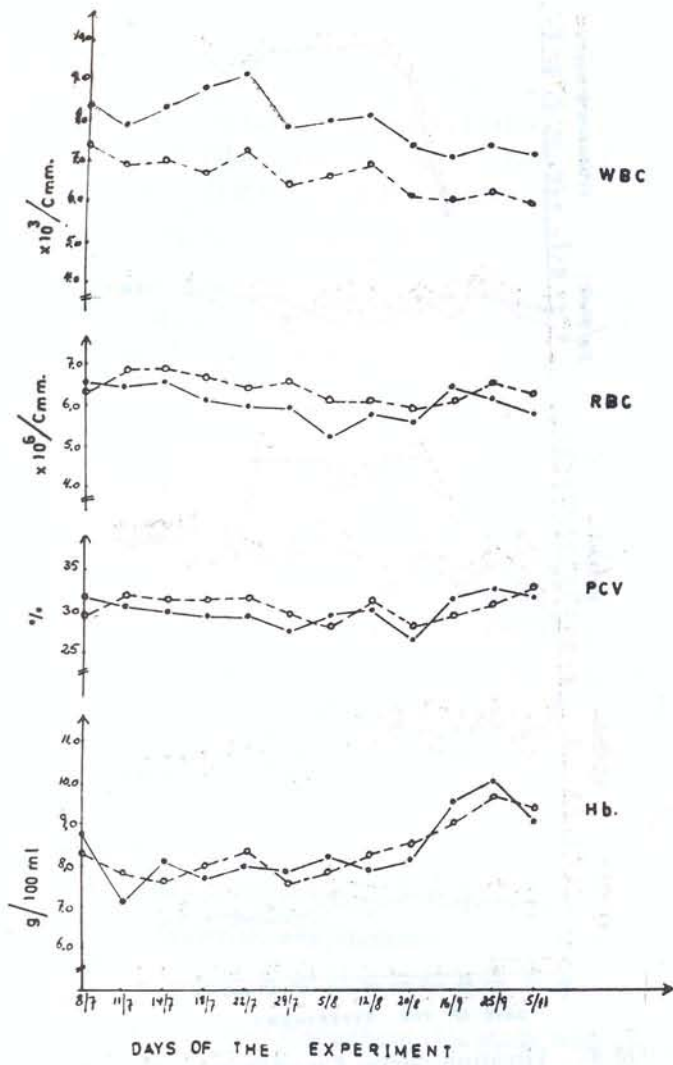


Fig 1: Hamematological parameters studied.

●—● Experimental animals.
○- - -○ Control

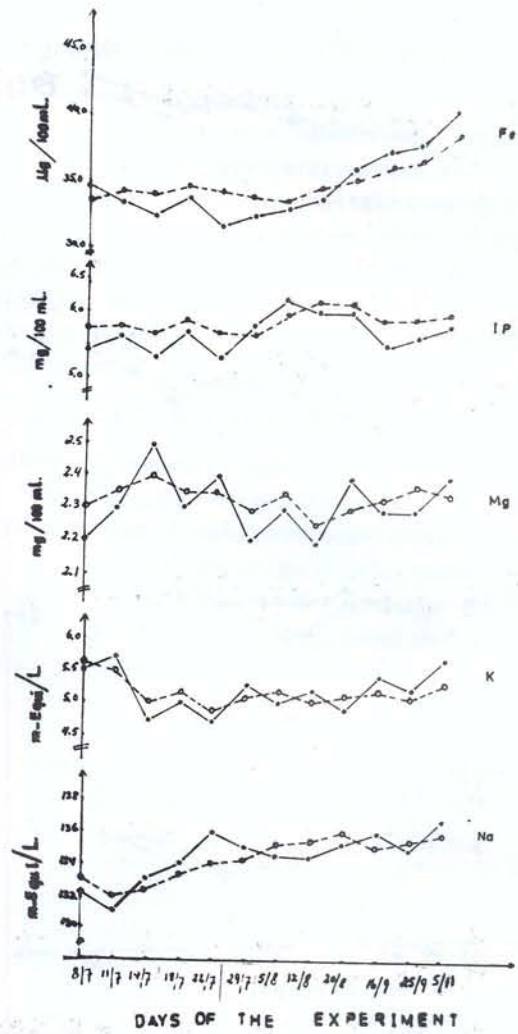


Fig 2: Fe, Ip, Mg, K and Na concentrations

●—● Experimental animals.
○- - -○ Control

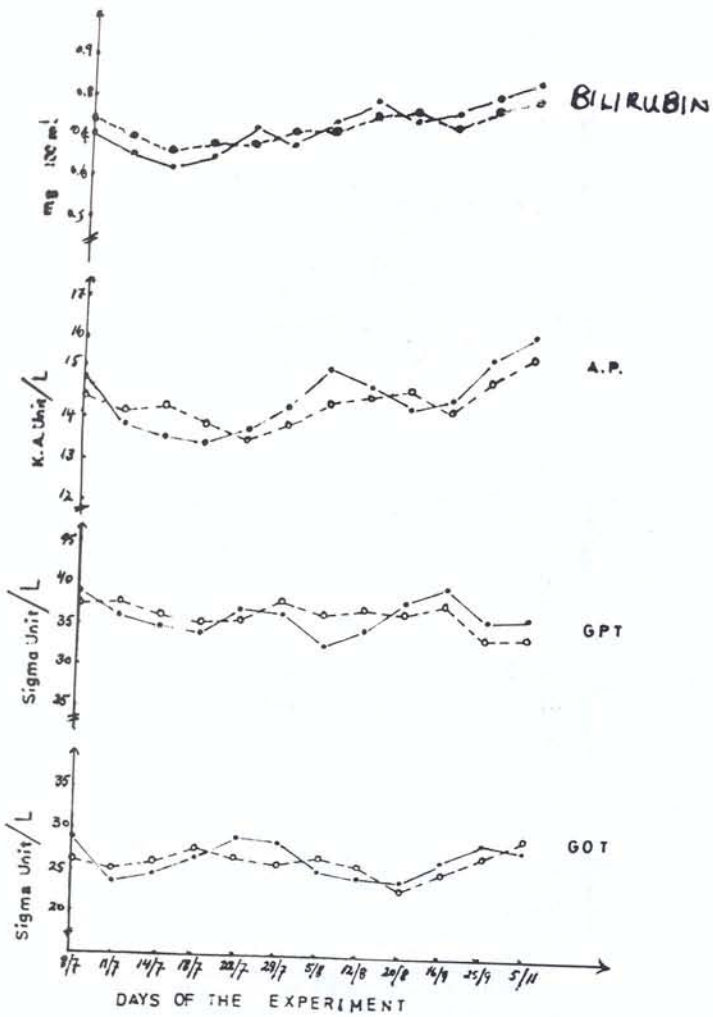


Fig 3: Bilirubin concentration and A.P, GPT, GOT enzymes activities.

—●— Experimental animals.
- - -○- Control

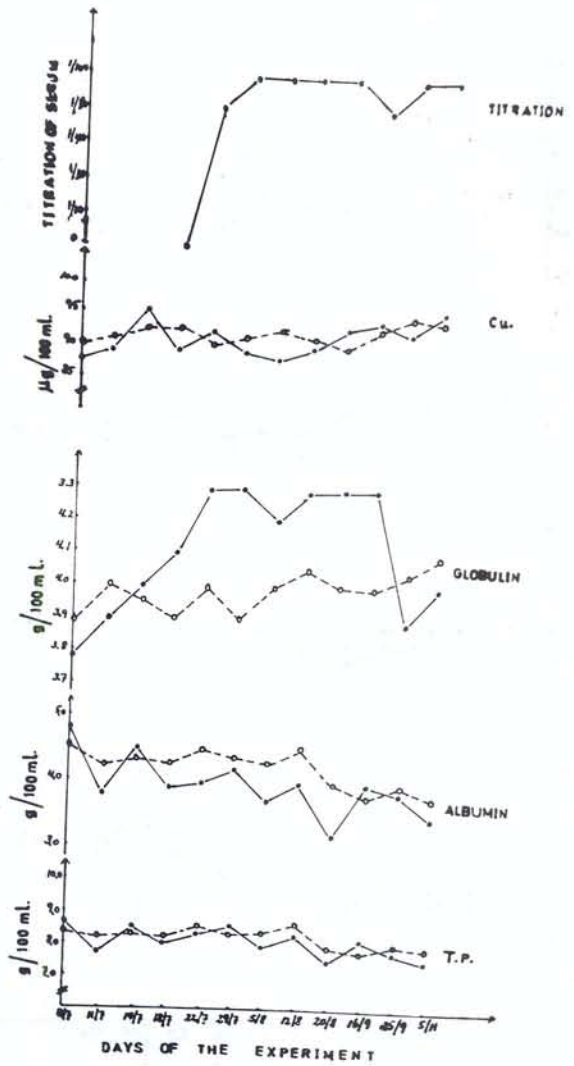


Fig 4: Titration curve, Cu, Albumin, Globulin & T.P. concentrations.

—●— Experimental animals.
- - -○- Control