EXPERIENCES WITH A LYOPHILISED CONTAGIOUS BOVINE
PLEUROPNEUMONIA VACCINE IN THE IVORY COAST

E. P. LINDLEY
FAO Animal Health Officer* Kerogho, Ivory Coast

SUMMARY

Trials on a lyophilised vaccine prepared from *M. mycoides* var. *mycoides* strain T1, were carried out on humpless N'dama and Baoulé cattle and on zebu cattle. Post-vaccinal complications in some animals made the vaccine unsuitable under prevailing conditions for widespread field use on the humpless cattle in Ivory Coast. However the post-vaccinal lesions can be controlled and the proven immunological effectiveness of this lyophilised product have convinced the author that its use should be gradually extended as staff training and improved facilities permit. The product was acceptable for field vaccination of the zebu herds.

The number and extent of local lesions were much reduced in herds re-vaccinated after one year. Serological findings based on the complement fixation test are discussed.

INTRODUCTION

The Republic of the Ivory Coast has a cattle population of about 380,000 most of which are humpless cattle of the N'dama and Baoulé breeds, known also collectively as taurins, kept in sedentary herds. In the Guinea savannah zone the taurins are potentially very important because of their tolerance to trypanosomiasis and to some tick-borne diseases. They are in relatively short supply and determined efforts are being made to augment their numbers. Unfortunately, they are very susceptible to contagious bovine pleuropneumonia (CBPP) and to some of the vaccines used to control this disease. Since 1965, an epizootic of CBPP has severely affected these taurin herds in West Africa (Anon, 1966) and CBPP control has been of prime importance to the Animal Health Service (Anon, 1969). Consequently there has been considerable interest in a Regional Campaign for the control of CBPP—on the lines of that which was mounted against Rinderpest 1963–67 (Lépissier & Macfarlane, 1966). The two diseases are very dissimilar particularly in their epizootiology; apart from other considerations, there is some doubt whether the vaccines at present available for the control of CBPP would be suitable for widespread use in such a regional campaign, involving many types of cattle in both clean and enzootic areas.

The past history of vaccination against CBPP in West Africa includes instances of the use of ineffective vaccines due frequently to failure to provide adequate protection. Lack of proper storage facilities when vaccine is transported over long distances accounts for some ineffective vaccinations, and in some cases, there have been severe post-vaccinal complications which have made vaccination unreliable and unwelcome to cattle owners. The goodwill and co-operation of the cattle owners is essential to the success of any regional scheme and any CBPP vaccine used must be safe as well as effective.

There is a considerable amount of published information on strain T1 *M. mycoides* var. *mycoides* (Piercy & Knight, 1958). Most of this is from East Africa and has been summarized by Davies & Gilbert (1969) but Doutre (1969) has confirmed the immunogenic properties of the strain in West African stock.

A decision was made to commence trials with this strain as there remained the

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LYOPHILISED CONTAGIOUS BOVINE PLEUROPNEUMONIA VACCINE

A crucially important question—could T1 vaccine be used with safety on the taurins of the Ivory Coast? During these trials, the opportunity was taken to compare various sites of inoculations as regards the post-vaccinal reactions.

In 1968, Dr. J. Orue of the Institut d'Élevage et de Médecine Vétérinaire des Pays Tropicaux (IEMVPT) at Dakar, Senegal, kindly prepared a lyophilised vaccine from strain T1/44. Recorded below are the trials made with this vaccine with special reference to its safety for the 'taurins' of the Ivory Coast.

MATERIALS AND METHODS

Both taurin and zebu cattle were used in the trials as noted in the tables. The initial tests were made on cattle on Government farms; extended trials followed on village cattle and some nomadic zebu herds.

Vaccine. The original lot of vaccine was prepared especially for these trials but the subsequent ones were routine batches, prepared by the IEMVPT, Dakar, from \textit{M. Mycoides} var. \textit{mycoides} strain T1/44 (Piercy & Knight, 1958). Cultures of at least 1 \( \times 10^9 \) organisms/ml were used (Doutre, 1969). Counts of the dried vaccine were made in Korhogo by a modified Miles and Misra technique (Lindley, 1965). The mean of 10 such counts indicated an average dose of 9.0 \( \times 10^9 \) viable organisms at the time of inoculation.

Some of the cattle used had been vaccinated previously with a lyophilised vaccine prepared by the IEMVPT, Dakar, from \textit{M. mycoides}, strain KH3J. This is a more attenuated strain of \textit{M. mycoides} which does not produce post-vaccinal lesions (Gambles, 1956) and to which serological response, as measured by the complement fixation test (CFT) is poor (Hudson, 1968).

Route of inoculation. All inoculations were made subcutaneously (S/C).

Site of inoculation. Four sites were used in the preliminary trials.

A. Tail—about 10 cm from tip, just above the "brush".
B. Laterally about the middle of the neck.
C. Midline over the nasal bone about 2 cm above the muzzle hairline.
D. Laterally in the middle of the chest over the eleventh rib.

Serology. In the preliminary trials blood samples were collected before vaccination and three to four weeks after. The technique for the CFT was that of Lindley (1960) with a modification of the complement dilutions to give a 0.17 log unit interval. In the tables a CFT "+" indicates a fixation of at least 0.34 log units of complement. Sera were also tested by the slide agglutination serum test (SAST) (Lindley, 1958).

Observations. Vaccinated animals were physically examined daily for three days following the inoculation and, subsequently, each week. The lesions were measured and animals with lesions greater than 10 cm in diameter were treated with Tylosin.* A single intramuscular injection of 7–10 ml of Tylan 200 (approximating to 7 mg/kg) was sufficient. Rarely was a second dose necessary and this only when the lesion was much larger than 10 cm.

In the extended trials involving village taurin cattle where strict control was impossible, representative (blood) sampling only was made, but frequent visits for observations and treatment were made throughout.

Post-Vaccinal Subcutaneous Reactions. These were measured as swellings in centimetres in two dimensions. In the tables:

"+" indicates a reaction less than 5 cm in diameter.
"++" indicates lesions greater than 5 cm but less than 10 cm.
"+++" indicates lesions greater than 10 cm.

RESULTS

These are noted in the tables.

Table I shows the first set of tests which were in taurins not previously vaccinated or vaccinated more than six months previously with KH3J strain vaccine. Various