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# Immunogenicity of two adjuvant formulations of an inactivated African horse sickness vaccine in guinea-pigs and target animals

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**Summary**

Monovalent, inactivated and adjuvanted vaccines against African horse sickness, prepared with serotypes 5 and 9, were tested on guinea-pigs to select the formulation that offered the greatest immunity. The final formulation of the vaccines took into account the immune response in the guinea-pig and the inflammatory properties of two types of adjuvant previously tested on target animals. A pilot study was subsequently conducted on horses using a vaccine prepared with serotype 9. The vaccine stimulated neutralising antibodies from the first administration and, after the booster dose, 28 days later; high antibody levels were recorded for at least 10 months. The guinea-pig appears to be a useful laboratory model for the evaluation of the antigenic properties of African horse sickness vaccines.

**Keywords**

African horse sickness, Adjuvant, BEI, Bromoethylenimine hydrobromide, Guinea-pig, Horse, Serum-neutralising index.

## Introduction

African horse sickness (AHS) is a non-contagious viral disease that affects solipeds. The aetiological agent is transmitted by arthropod vectors of the genus *Culicoides*. Like bluetongue virus, AHS virus belongs to the genus *Orbivirus*, family *Reoviridae*; nine serotypes with variable pathogenicity have been identified. Four clinical forms of disease have been described in the horse (7). Clinical symptoms can also be observed in European and Asian donkeys and mules and in the African donkey. The infection takes a subclinical form in the zebra (23).

The disease is endemic in many countries of sub-Saharan Africa, but virus incursions have occurred in North Africa (1965), Spain (1966 and 1987-1990) and the Middle East and south-west Asia (1959, 1961, 1989) (23). To date, incursions of AHS virus beyond the endemic area have been caused by a single serotype, either serotype 4 or serotype 9 (23).

The experience of the last few decades has shown that Italy is a country that is particularly exposed to incursions by infectious 'emerging' agents responsible for diseases that are endemic to the African continent. The presence in Italy of arthropods of the genus *Culicoides* makes an incursions and the spread of the AHS virus a possibility that should not be underestimated. Diagnostic tests to confirm the infection and identify the serotype responsible for the outbreak must be available, together with safe vaccines that provide long-lasting immunity.

In the countries where the disease is endemic, a live attenuated vaccine manufactured in South Africa by Onderstepoort Biological Products (OBP), containing seven of the nine

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