EFFICIENCY OF OIL ADJUVANTED INFECTIOUS BRONCHITIS VACCINES

M. Guittet, V. Marius, J.P. Picault, G. Bennejean, H. Lecoq, J. Lamande
Ministère de l'Agriculture, Direction de la Qualité, Services Vétérinaires
Laboratoire National de Pathologie Aviaire, B.P. 9, 22440 PLOUFRAGAN,
FRANCE

ABSTRACT

Four inactivated oil emulsion experimental and commercial infectious bronchitis vaccines were evaluated in non-vaccinated layers and in layers previously vaccinated with live vaccines, for their ability to increase the intensity and persistence of the immune response.

Experiments were performed on two specific pathogen free flocks which received only oil adjuvanted vaccines (OAV) and six conventional flocks previously vaccinated with live vaccines.

It is concluded that commercial OAV vaccines administered after live ones give better results in terms of both antibody responses and egg production. Revaccination of birds with H52 strain vaccine after a primary vaccination with H120 strain seems worthless if an oil adjuvanted vaccine is used for revaccination before lay.

INTRODUCTION

The ability of inactivated oil adjuvanted vaccines to prevent avian virus infections has been successfully demonstrated several years ago for Newcastle disease (ND), egg drop syndrome (EDS) and infectious bursal disease (IBD).

In the past, inactivated infectious bronchitis (I.B.) vaccines prepared with aluminium hydroxide adjuvant failed to protect birds under field conditions despite conclusive laboratory evidence of efficacy (Berry, 1965a, b, 1966; Box et al., 1966; Brion et al., 1969; Swarbrick et al., 1967 ). For this reason, studies have been carried out on the use of oil emulsions in the preparation of I.B. inactivated vaccines.

The development of these new I.B. vaccines led us to investigate their efficiency by both serological and challenge methods, and to evaluate their role in vaccination programmes for breeders and layers.

MATERIAL AND METHODS

Experimental birds and housing

Specific pathogen free (SPF) birds

Flock A : 52 twenty–three week old white Leghorn female breeders reared in isolators were housed in laying cages in separately ventilated rooms.
Flock B : 96 seventeen week old Warren pullets, previously reared in an isolated farm and serologically controlled for SPF status were transferred to laying cages in isolated rooms.

Conventional birds reared in field conditions until transferred or not to experimental units:

Flock C : 70 of 320 Warren pullets were transferred to experimental rooms at fourteen weeks old. The rest were moved at eighteen weeks old.

Flock D : 120 of 276 Warren and 36 Ross pullets from the same flock were transferred to experimental rooms at fourteen weeks old. The rest were moved at twenty weeks old.

Flock E : 125 fourteen week old Warren pullets were transferred to experimental rooms.

Flocks F, G, H : these three flocks were reared on the same farm throughout their life. F and H were laying flocks each containing 6 000 birds of different commercial breeds. G was a broiler breeder flock containing 3 500 birds of different breeds.

Vaccines and I.B. vaccination schedules

A number of different oil adjuvanted inactivated vaccines were studied. All were prepared with the Massachusetts strain and all except one were commercial products:

- OAV₁ : monovalent experimental vaccine
- OAV₂ : bivalent vaccine (I.B. + ND)
- OAV₃ : monovalent vaccine
- OAV₄ : trivalent vaccine (I.B. + N.D. + E.D.S.)

Inactivated I.B. vaccines were administered by intramuscular injection of 0.5 ml per bird.

Live vaccines were standard commercial bio-products : H 120, H 52, and MM strains administered by spray.

The different vaccination schedules are summarised in table 1 for flocks A and B, in table 2 for flocks C, D and E, in table 3 for flocks F, G and H.

Challenge

The I.B. virus challenge was the M 41 strain administered by different routes. The birds of flock C were challenged by the tracheal route with $10^3$ EID50/0.2 ml per animal. The birds of flocks A and D were challenged both intra-tracheally with $10^3$ EID50 per animal and by nebulisation with the