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Infectious Bursal Disease Vaccine, Inactivated

General Notices

Gumboro Disease Vaccine, Inactivated

(Avian Infectious Bursal Disease Vaccine (Inactivated), Ph. Eur. monograph 0960)

CAUTION: Accidental Injection of oily vaccine can cause serious local reactions in man. Expert medical advice should be sought immediately and the doctor should be informed that the vaccine is an oil emulsion.

Ph Eur

1 DEFINITION

Avian infectious bursal disease vaccine (inactivated) is a preparation of a suitable strain of avian infectious bursal disease virus type 1, inactivated while maintaining adequate immunogenic properties. This monograph applies to vaccines intended for use in breeding chickens to protect their progeny from avian infectious bursal disease.

2 PRODUCTION

2-1 PREPARATION OF THE VACCINE

The vaccine virus is grown in embryonated hens' eggs or in cell cultures.

The vaccine may be adjuvanted.

2-2 SUBSTRATE FOR VIRUS PROPAGATION

2-2-1 Embryonated hens' eggs

If the vaccine virus is grown in embryonated hens' eggs, they are obtained from healthy flocks (*5.2.13*).

2-2-2 Cell cultures

If the vaccine is grown in cell cultures, they comply with the requirements for cell cultures for the production of vaccines for veterinary use (*5.2.4*).

2-3 CHOICE OF VACCINE COMPOSITION

The vaccine is shown to be satisfactory with respect to safety (*5.2.6*) and efficacy (*5.2.7*) for the birds for which it is intended.

The following tests for safety (section 2-3-1) and immunogenicity (section 2-3-2) may be used during the demonstration of safety and efficacy.

2-3-1 Safety

The test is carried out for each route of administration to be recommended for vaccination. Use a batch of vaccine containing not less than the maximum potency that may be expected in a batch of vaccine.

For each test, use not fewer than 8 chickens not older than the minimum age to be recommended for vaccination and from a flock free from specified pathogens (SPF) (*5.2.2*). Administer by a route and method to be recommended to each chicken 1 dose of the vaccine. Observe the chickens at least daily for at least 14 days after the administration of the vaccine.

The test is not valid if non-specific mortality occurs. The vaccine complies with the test if no chicken shows abnormal signs of disease or dies from causes attributable to the vaccine.

2-3-2 Immunogenicity

A test is carried out for each route and method of administration to be recommended using in each case chickens from an SPF flock (*5.2.2*) and not older than the minimum age to be recommended for vaccination (close to the point of lay). The dose of vaccine administered to each chicken contains not more than the minimum potency to be stated on the label.

Where a challenge test is to be carried out, the following test may be used. Use 2 groups of not less than 20 hens treated as follows:

— group A: unvaccinated controls;

— group B: vaccinated with inactivated avian infectious bursal disease vaccine.

Serum samples are collected from each unvaccinated control (group A) hen just before administration of the vaccine, 4-6 weeks later, and at the time of egg collection for hatching. If a serological test is to be carried out for demonstration of immunogenicity by other routes, serum samples are also collected from each vaccinated (group B) hen at the time of egg collection for hatching. The antibody response is measured in a serum-neutralisation test.

Eggs are collected for hatching not less than 5 weeks after vaccination and the test described below is carried out with chickens at least 3 weeks old from that egg collection.

25 chickens from vaccinated (group B) hens and 10 control chickens of the same breed and age from unvaccinated (group A) hens are challenged with an eye-drop application of a quantity of a virulent strain of avian infectious bursal disease virus sufficient to produce severe signs of disease, including lesions of the bursa of Fabricius, in all unvaccinated chickens. 3-4 days after challenge, the bursa of Fabricius is removed from each chicken. The bursae are examined for evidence of infection by histological examination and by testing for the presence of avian infectious bursal disease antigen by a suitable method. The vaccine complies with the test if 3 or fewer of the chickens from group B hens show evidence of avian infectious bursal disease. The test is invalid unless all the chickens from group A hens show evidence of avian infectious bursal disease.

Where there is more than one recommended route of administration, the test described under Potency is carried out in parallel with the above immunogenicity test, using different groups of chickens for each recommended route. The serological response of the chickens inoculated by routes other than that used in the immunogenicity test is not significantly less than that of the group vaccinated by that route.

2-4 MANUFACTURER'S TESTS

2-4-1 Residual live virus

An amplification test for residual live avian infectious bursal disease virus is carried out on each batch of antigen immediately after inactivation to confirm inactivation; the test is carried out in suitable cell cultures or in embryonated hens' eggs, whichever is the most sensitive for the vaccine strain; the quantity of inactivated virus harvest used in the test is equivalent to not less than 10 doses of the vaccine.

A. For vaccine prepared with cell-culture-adapted strains of virus, inoculate an amount equivalent to not less than 10 doses into suitable cell cultures. Incubate at 38 ± 1 °C for 7 days. Make a passage on another set of cell cultures and incubate at 38 ± 1 °C for 7 days.

The inactivated virus harvest complies with the test if the cultures show no signs of infection.

B. For vaccine prepared with embryo-adapted strains of virus, inject 0.2 mL of inactivated virus harvest into the allantoic cavity or onto the chorio-allantoic membrane of ten 9- to 11-day-old embryonated hen eggs from an SPF flock (*5.2.2*). Incubate the eggs and observe at least daily for 6 days. Pool separately the allantoic liquid or membranes from eggs containing live embryos, and that from eggs containing dead embryos, excluding those that die from non-specific causes within 24 h of the injection.

Inject into the allantoic cavity or onto the chorio-allantoic membrane of each of ten 9- to 11-day-old SPF eggs 0.2 mL of the pooled allantoic liquid or crushed chorio-allantoic membranes from the live embryos and, into each of 10 similar eggs, 0.2 mL of the pooled liquid or membranes from the dead embryos and incubate for 6 days. Examine each embryo for lesions of avian infectious bursal disease. If more than 20 per cent of the embryos die at either stage repeat that stage.

The inactivated virus harvest complies with the test if there is no evidence of lesions of avian infectious bursal disease and if, in any repeat test, not more than 20 per cent of the embryos die from non-specific causes.

Antibiotics may be used in the test to control extraneous bacterial infection.

2-4-2 Batch potency test

It is not necessary to carry out the potency test (section 3-3) for each batch of the vaccine if it has been carried out using a batch of vaccine with a minimum potency. Where the test is not carried out, an alternative validated method is used, the criteria for acceptance being set with reference to a batch of vaccine that has given satisfactory results in the test described under Potency. The following test may be used.

Vaccinate each of not fewer than 10 chickens, 14-28 days old and from an SPF flock (*5.2.2*), with 1 dose of vaccine by a recommended route. 4-6 weeks later, collect serum samples from each bird and not fewer than 3 unvaccinated control birds of the same age and from the same source. Measure the antibody response in a serum-neutralisation test.

The test is not valid if there are specific antibodies in the sera of the unvaccinated birds. The vaccine complies with the test if the mean antibody titre in the sera from the vaccinated birds is equal to or greater than the titres obtained with a batch that has given satisfactory results in the test described under Potency.

3 BATCH TESTS

3-1 Identification

The vaccine contains the antigen or antigens stated under Definition.

3-2 Bacteria and fungi

The vaccine, including where applicable the diluent supplied for reconstitution, complies with the test for sterility prescribed in the general monograph *Vaccines for veterinary use (0062)*.

3-3 Potency

The vaccine complies with the requirements of the test prescribed under Immunogenicity (section 2-3-2) when administered by a recommended route and method.

4 LABELLING

The label states whether the strain in the vaccine is embryo-adapted or cell-culture-adapted.