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Duck Viral Hepatitis Type I Vaccine (Live)

General Notices

(Ph. Eur. monograph 1315)

Ph Eur

1 DEFINITION

Duck viral hepatitis type I vaccine (live) is a preparation of a suitable strain of duck hepatitis virus type I. This monograph applies to vaccines intended for the active immunisation of breeder ducks in order to protect passively their progeny and/or for the active immunisation of ducklings.

2 PRODUCTION

2-1 PREPARATION OF THE VACCINE

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

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 flocks free from specified pathogens (SPF) (*5.2.2*).

2-2-2 Cell cultures

If the vaccine virus 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 VIRUS

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

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

2-3-1 Safety

Carry out the test for each route and method of administration to be recommended for vaccination using in each case susceptible domestic ducks (*Anas platyrhynchos*) not older than the minimum age to be recommended for vaccination and that do not have antibodies against duck hepatitis virus type I. Use vaccine virus at the least attenuated passage level that will be present in a batch of the vaccine.

For each test performed in ducklings younger than 3 weeks of age, use not fewer than 10 ducklings. For each test performed in ducklings older than 3 weeks of age, use not fewer than 8 ducklings. Administer to each duckling a quantity of vaccine virus equivalent to not less than 10 times the maximum virus titre likely to be contained in 1 dose of vaccine. Observe the ducklings at least daily for at least 14 days.

The test is not valid if more than 10 per cent of the ducklings younger than 3 weeks of age show abnormal signs of disease or die from causes not attributable to the vaccine. For ducklings older than 3 weeks of age, the test is not valid if non-specific mortality occurs.

The vaccine virus complies with the test if no duckling shows abnormal signs of disease or dies from causes attributable to the vaccine virus.

2-3-2 Increase in virulence

Carry out the test according to general chapter *5.2.6* using 1-day-old domestic ducklings that do not have antibodies against duck hepatitis virus type I. If the properties of the vaccine virus allow sequential passage through 5 groups via natural spreading, this method may be used, otherwise passage as described below is carried out.

Administer to each duckling of the 1st group by the oro-nasal route a quantity of vaccine virus that will allow recovery of virus for the passages described below. 2 to 4 days later, take samples of liver from each duckling and pool the samples. Administer 1 mL of the pooled liver suspension by the oro-nasal route to each duckling of the next group. Carry out this operation 4 times. Verify the presence of the virus at each passage. If the virus is not found at a passage level, repeat the passage by administration to a group of 10 ducklings. Observe the ducklings given the last passage at least daily for 21 days.

If the 5th group of ducklings shows no evidence of an increase in virulence indicative of reversion during the observation period, further testing is not required. Otherwise, carry out an additional safety test and compare the clinical signs and any relevant parameters in a group of at least 10 ducklings receiving the material used for the 1st passage and another similar group receiving the virus at the final passage level.

The vaccine virus complies with the test if no indication of an increase in virulence of the virus at the final passage level compared with the material used for the 1st passage is observed. If the virus is not recovered after an initial passage in 5 ducklings and a subsequent repeat passage in 10 ducklings, the vaccine virus also complies with the test.

2-3-3 Immunogenicity

A test is carried out for each route and method of administration to be recommended for vaccination, using in each case domestic ducks not older than the minimum age to be recommended for vaccination. The quantity of the vaccine virus administered to each bird is not greater than the minimum virus titre to be stated on the label and the virus is at the most attenuated passage level that will be present in a batch of the vaccine.

2-3-3-1 Vaccines for passive immunisation of ducklings

Use for the test not fewer than 15 laying ducks or ducks intended for laying, as appropriate, of the same origin and that do not have antibodies against duck hepatitis virus type I. Vaccinate by a route to be recommended not fewer than 10 ducks using the schedule to be recommended. Maintain not fewer than 5 ducks as controls. Starting from 4 weeks after onset of lay, collect embryonated eggs from vaccinated and control ducks and incubate them. Challenge not fewer than twenty 1-week-old ducklings representative of the vaccinated group and not fewer than 10 from the control group by the oro-nasal route with a sufficient quantity of virulent duck hepatitis virus type I. Observe the ducklings at least daily for 14 days after challenge. Record the deaths and the number of surviving ducklings that show clinical signs of disease.

The test is not valid if:

— during the observation period after challenge fewer than 70 per cent of the challenged ducklings from the control ducks die or show typical signs of the disease;

— and/or during the period between vaccination and collection of the eggs more than 10 per cent of the control or vaccinated ducks show abnormal clinical signs or die from causes not attributable to the vaccine.

The vaccine virus complies with the test if during the observation period after challenge the percentage relative protection calculated using the following expression is not less than 80 per cent:

V	=	percentage of challenged ducklings from vaccinated ducks that survive to the end of the observation period without clinical signs of the disease;
C	=	percentage of challenged ducklings from unvaccinated control ducks that survive to the end of the observation period without clinical signs of the disease.

2-3-3-2 Vaccines for active immunisation of ducklings

Use for the test not fewer than 30 ducklings of the same origin and that do not have antibodies against duck hepatitis virus type I. Vaccinate by a route to be recommended not fewer than 20 ducklings. Maintain not fewer than 10 ducklings as controls. Challenge each duckling after at least 5 days by the oro-nasal route with a sufficient quantity of virulent duck hepatitis virus type I. Observe the ducklings at least daily for 14 days after challenge. Record the deaths and the number of surviving ducklings that show clinical signs of disease.

The test is not valid if:

— during the observation period after challenge fewer than 70 per cent of the control ducklings die or show typical signs of the disease;

— and/or during the period between vaccination and challenge more than 10 per cent of the control or vaccinated ducklings show abnormal clinical signs or die from causes not attributable to the vaccine.

The vaccine virus complies with the test if during the observation period after challenge the percentage relative protection calculated using the following expression is not less than 80 per cent:

V	=	percentage of challenged vaccinated ducklings that survive to the end of the observation period without clinical signs of the disease;
C	=	percentage of challenged unvaccinated control ducklings that survive to the end of the observation period without clinical signs of the disease.

3 BATCH TESTS

3-1 Identification

The vaccine, diluted if necessary, is identified using a suitable method. For example, when mixed with a monospecific duck hepatitis virus type I antiserum, it is no longer able to infect embryonated hens' eggs from an SPF flock (*5.2.2*) or susceptible cell cultures (*5.2.4*) into which it is inoculated.

3-2 Bacteria and fungi

Vaccines intended for administration by injection comply with the test for sterility prescribed in the general monograph *Vaccines for veterinary use (0062)*.

Any diluent supplied for reconstitution of the vaccine complies with the test for sterility prescribed in the general monograph *Vaccines for veterinary use (0062)*.

3-3 Mycoplasmas (*2.6.7*)

The vaccine complies with the test for mycoplasmas.

3-4 Extraneous agents (*5.2.5*)

The vaccine is free from extraneous agents.

3-5 Virus titre

Titrate the vaccine virus by inoculation into embryonated hens' eggs from an SPF flock (5.2.2) or into suitable cell cultures (5.2.4). The vaccine complies with the test if 1 dose contains not less than the minimum virus titre stated on the label.

3-6 Potency

Depending on the indications, the vaccine complies with 1 or both of the tests prescribed under Immunogenicity (section 2-3-3), when administered by a recommended route and method. It is not necessary to carry out the potency test for each batch of the vaccine if it has been carried out on a representative batch using a vaccinating dose containing not more than the minimum virus titre stated on the label.

4 LABELLING

If it has been found that the vaccine may show reversion to virulence, the label indicates the precautions necessary to avoid transmission of virulent virus to unvaccinated ducklings.
