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Feline Infectious Enteritis Vaccine, Inactivated

General Notices

Feline Panleucopenia Vaccine, Inactivated

(Feline Infectious Enteritis (Feline Panleucopenia) Vaccine (Inactivated), Ph. Eur. monograph 0794)

Ph Eur

1 DEFINITION

Feline infectious enteritis (feline panleucopenia) vaccine (inactivated) is a preparation of a suitable strain of feline panleucopenia virus or canine parvovirus inactivated while maintaining adequate immunogenic properties. This monograph applies to vaccines intended for the active immunisation of cats against feline infectious enteritis (feline panleucopenia).

2 PRODUCTION

2-1 PREPARATION OF THE VACCINE

The vaccine virus is grown in cell cultures. The virus harvest is inactivated. The vaccine may be adjuvanted.

2-2 SUBSTRATE FOR VIRUS PROPAGATION

2-2-1 Cell cultures

The cell cultures comply with the requirements for cell cultures for production of veterinary vaccines (*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 cats 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

Carry out the test for each route and method 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 cats of the minimum age to be recommended for vaccination and that do not have antibodies against feline panleucopenia virus. Administer to each cat 1 dose of the vaccine. If the schedule to be

recommended requires a 2nd dose, administer 1 dose after an interval of at least 14 days. Observe the cats at least daily for at least 14 days after the last administration.

The vaccine complies with the test if no cat shows abnormal local or systemic reactions 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 for vaccination, using in each case cats 8-12 weeks old. The vaccine administered to each cat is of minimum potency.

Use for the test not fewer than 10 cats that do not have antibodies against feline panleucopenia virus and canine parvovirus. Vaccinate not fewer than 5 cats, according to the schedule to be recommended. Maintain not fewer than 5 cats as controls. Carry out leucocyte counts 8 days and 4 days before challenge and calculate the mean of the 2 counts to serve as the initial value. Challenge each cat after 20-22 days by the intraperitoneal route with a sufficient quantity of a suspension of virulent feline panleucopenia virus. Observe the cats at least daily for 14 days after challenge. Carry out leucocyte counts on the 4th, 6th, 8th and 10th days after challenge.

The test is not valid if during the observation period after challenge, fewer than 100 per cent of the control cats show on not fewer than one occasion a diminution in the number of leucocytes of at least 75 per cent of the initial value or die from panleucopenia. The vaccine complies with the test if during the observation period after challenge, all the vaccinated cats survive and show no signs of disease nor leucopenia; that is to say, the diminution in the number of leucocytes does not exceed, in any of the 4 counts, 50 per cent of the initial value.

2-4 MANUFACTURER'S TESTS

2-4-1 Residual live virus

The test for residual live virus is carried out using a quantity of inactivated virus harvest equivalent to not less than 100 doses of the vaccine by a validated method such as the following: inoculate into suitable non-confluent cells and after incubation for 8 days, make a subculture using trypsinised cells. After incubation for a further 8 days, examine the cultures for residual live parvovirus by an immunofluorescence test. The immunofluorescence test may be supplemented by a haemagglutination test or other suitable tests on the supernatant of the cell cultures. The inactivated virus harvest complies with the test if no live virus is detected.

2-4-2 Batch potency test

For routine testing of batches of vaccine, a test based on production of haemagglutination-inhibiting antibodies in guinea-pigs may be used instead of test 3-4-1 or 3-4-2 described under Potency if a satisfactory correlation with the test for immunogenicity has been established.

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 monograph *Vaccines for veterinary use (0062)*.

3-3 Residual live virus

This test may be omitted for batch release, as stated in the monograph Vaccines for veterinary use (0062).

Carry out a test for residual live virus by inoculating not less than 10 doses of vaccine into suitable non-confluent cells; after incubation for 8 days, a subculture is made using trypsinised cells. After incubation for a further 8 days, the cultures

are examined for residual live parvovirus by an immunofluorescence test. The immunofluorescence test may be supplemented by a haemagglutination test or other suitable tests on the supernatant of the cell cultures. The vaccine complies with the test if no live virus is detected. If the vaccine contains an adjuvant that interferes with the test, separate it if possible from the liquid phase of the vaccine by a method that does not inactivate the virus or otherwise interfere with the detection of live viruses.

3-4 Potency

Carry out test 3-4-1 or test 3-4-2.

3-4-1 Test in cats for haemagglutination-inhibiting antibodies. Use for the test not fewer than 4 cats, 8-12 weeks old, that do not have antibodies against feline panleucopenia virus and canine parvovirus. Vaccinate not fewer than 2 cats with 1 dose of the vaccine. Maintain not fewer than 2 cats as controls. After 21 days, draw a blood sample from each cat and separate the serum from each sample. Inactivate each serum by heating at 56 °C for 30 min. To 1 volume of each serum add 9 volumes of a 200 g/L suspension of *light kaolin R* in *phosphate buffered saline pH 7.4 R*. Shake each mixture for 20 min. Centrifuge, collect the supernatant and mix with 1 volume of a concentrated suspension of pig erythrocytes. Allow to stand at 4 °C for 60 min and centrifuge. The dilution of the serum obtained is 1:10. Using each serum, prepare a series of twofold dilutions. To 0.025 mL of each of the latter dilutions add 0.025 mL of a suspension of canine parvovirus or feline panleucopenia virus antigen containing 4 haemagglutinating units. Allow to stand at 37 °C for 30 min and add 0.05 mL of a suspension of pig erythrocytes containing 30×10^6 cells per millilitre. Allow to stand at 4 °C for 90 min and note the last dilution of serum that still completely inhibits haemagglutination.

The test is not valid if either control cat develops antibodies against canine parvovirus or feline panleucopenia virus. The vaccine complies with the test if both vaccinated cats have developed titres of at least 1:20.

3-4-2 Test in cats for virus-neutralising antibodies. Use for the test not fewer than 2 cats, 8-12 weeks old, that have antibody titres less than $4ND_{50}$ per 0.1 mL of serum measured by the method described below. Vaccinate each cat according to the recommended schedule. 14 days after vaccination, examine the serum of each cat as follows. Heat the serum at 56 °C for 30 min and prepare serial dilutions using a medium suitable for feline cells. Add to each dilution an equal volume of a virus suspension containing an amount of virus such that when the volume of serum-virus mixture appropriate for the assay system is inoculated into cell cultures, each culture receives approximately 10^4 $CCID_{50}$. Incubate the mixtures at 37 °C for 1 h and inoculate 4 feline cell cultures with a suitable volume of each mixture. Incubate the cell cultures at 37 °C for 7 days, passage and incubate for a further 7 days. Examine the cultures for evidence of specific cytopathic effects and calculate the antibody titre.

The vaccine complies with the test if the mean titre is not less than 32 ND_{50} per 0.1 mL of serum. If one cat fails to respond, repeat the test using 2 more cats and calculate the result as the mean of the titres obtained from all of the 3 cats that have responded.
