

Feline Leukaemia Virus (FeLV proviral DNA)

Feline leukaemia virus (FeLV) is a retrovirus, this means that copies of the virus are integrated into the genome of infected cells. Unless the infection is blocked by host immunity, within the first 2 weeks following exposure the virus integrates into bone marrow progenitor cells causing persistent infection. This 'proviral DNA' is then detectable in bone-marrow derived white blood cells (i.e. host neutrophils, eosinophils, and basophils).



The Molecular Diagnostic Unit was the first laboratory in the UK to offer a quantitative PCR (qPCR) assay for the detection of FeLV proviral-DNA. Our assay can reliably confirm infection in cats following a positive serology result - i.e. antigen detection using ELISA or immunochromatographic (a.k.a. lateral flow) tests - or successful virus isolation. Our assay can also detect FeLV infection in cats that test negative by other methods (e.g. early infection).

Our test also quantifies of the amount of FeLV proviral-DNA in the blood of cats. High levels of FeLV proviral-DNA are consistently found in progressively infected (i.e. viraemic) cats, i.e. those which also persistently test positive by ELISA and virus isolation. However, FeLV proviral-DNA can also be present at lower levels in cats that are negative by other methods; these are known as regressively-infected cats.

FAQs

What initial screening method do you recommend for FeLV?

ELISA or lateral flow testing for FeLV p27 antigen (i.e. the protein that forms the viral capsid) in plasma/serum (or blood; although this can affect interpretation) is still a good valid initial screening test for FeLV infection in individual cats – this is often done 'in-house' using point-of-care tests but can also be done by external laboratories.

If obtaining blood is difficult/impossible or if pooled samples need to be analysed to reduce costs – FeLV qPCR testing for viral RNA in saliva samples can also be used as a screening test for FeLV infection, but this cannot be done in-house and, consequently, each individual test is more expensive.

When should FeLV DNA (provirus) qPCR testing be done?

Situations in which FeLV proviral-DNA qPCR testing should be considered:

- As a confirmatory test for positive or equivocal FeLV p27 antigen test results
- For the detection of regressively infected cats (i.e. those that are antigen negative), including screening of multicat households

Reception Hours

Mon-Fri 9am - 5pm

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- Testing of cats as early as possible after a potential FeLV exposure event – as FeLV proviral-DNA becomes detectable earlier (1-2 weeks after FeLV exposure) than detection of FeLV p27 antigen (usually 2-3 weeks after FeLV exposure, but can be up to 6 weeks)
- In clinical cases that are FeLV p27 antigen negative, where a strong suspicion of FeLV-related disease remains.
- To screen potential feline blood donors and blood production prior to transfusion (to reduce the risk of iatrogenic transmission).

How do I interpret a positive FeLV DNA (provirus) qPCR test?

A positive result indicates FeLV infection. If the FeLV proviral-DNA load is high (*i.e. there is a low CT value*), there is a good probability that the cat is FeLV p27 antigen positive at the time point tested. If not already performed, test for FeLV p27 antigen.

Several weeks into FeLV infection, but not at very early time points after initial FeLV exposure, blood FeLV DNA loads can also be used to differentiate cats with progressive and regressive infection. So repeat FeLV DNA qPCR testing is likely to be required to determine if the cat has progressive or regressive infection. Interpretation should be made in light of the clinical signs the cat is showing e.g. if showing signs of disease associated with FeLV, then a positive result is more likely to reflect progressive infection.

False positive results are extremely unlikely as this is a very specific test and our laboratory uses best practice including use of controls.

How do I interpret a negative FeLV DNA (provirus) qPCR test?

The cat is not FeLV DNA positive and so the cat was either not exposed to FeLV, underwent an abortive infection or is in the first 1-2 weeks of FeLV infection, as it takes this long for cats to become FeLV DNA qPCR positive following exposure.

Each FeLV proviral-qPCR includes an internal amplification control to ensure that an individual negative result is valid.

More information can be found on the ABCD website: [Feline Leukaemia Virus Infection | \(abcdcatsvets.org\)](http://abcdcatsvets.org)

Updated March 2022 by Dr Emi Barker

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