

# Performance of the Abaxis VetScan® Feline FeLV/FIV Rapid Test

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## Introduction

The Feline Leukemia Virus (FeLV) is a common infectious pathogen of cats. It is associated with many disease conditions including neoplasia (lymphoma) and increased susceptibility to secondary infection. It can attack any system in the cat's body causing a chronic wasting disease or an acute life threatening event. The disease usually affects the cat's immune system and may secondarily affect other body systems. The virus can also cause cancer of the immune system, most notably B-cell lymphoma.<sup>1</sup>

Clinical findings can include enlargement of the visceral (common) or peripheral (uncommon) lymph nodes, pleural effusion, a cranial mediastinal mass, icterus due to hepatic lymphoma, and lymphoid, erythrocytic, and granulocytic leukemias. Nasal lymphoma may result in chronic sneezing and nasal discharge. Lymphomatous masses may form in the small bowel, and infiltrative lymphoma of the small bowel wall may occur. These may result in chronic vomiting, chronic diarrhea, and weight loss. Other findings include neurologic signs and persistent fever. Several non-neoplastic diseases may also occur including a panleukopenia-like syndrome and abortion.<sup>2</sup>

FeLV is a retrovirus that is infectious to domestic cats only; dogs and humans are not affected. The infection is transmitted via casual contact, bite wounds, inter-cat grooming, and sharing of food and water dishes. Queens may transmit it to their kittens in utero or by nursing. It is mainly seen in cats between one and six years of age. Outdoor cats and multiple cat households have increased prevalence of disease. The disease is slightly more common in male cats.<sup>3</sup>

The presence of the FeLV can be diagnosed by a test that detects the presence of the p27 antigen, an antigen specific to this virus. The p27 antigen can be detected by immunofluorescence assay (IFA) and enzyme linked immunosorbent assay (ELISA). IFA has the potential for false negative results if testing occurs too early. For IFA testing to be positive, the virus must first spread to the bone marrow which takes about three weeks. The ELISA test turns positive within one to three days after infection so it is preferred as a screening test. However, some cats will reject the initial infection after a few days so persistent infection should be confirmed if it is possible that the infection is very recent. A persistent infection is confirmed with a second positive ELISA test performed two weeks after the first positive test or with a single positive IFA test done after the positive ELISA test.<sup>4</sup>

The Feline Immunodeficiency Virus (FIV) is another common feline retrovirus that has the potential to impact the immune system. FIV is a retrovirus that is related to the Human Immunodeficiency Virus (HIV); however, FIV is infectious to cats only. The virus is transmitted via saliva, most commonly by bites from infected cats. Transmission via social contact, including grooming by infected cats and sharing common food and water dishes, is much less likely. Rarely, it can be spread from mother to kittens via placental transfer. Outdoor cats and multiple cat households have increased prevalence of disease. The disease is more common in intact males due to their fighting propensity.<sup>5</sup>

The effects of the FIV on the immune system may be delayed for several years; however, when the virus becomes active it results in poor appetite, gradual weight loss, and lethargy. Cats can potentially survive many years asymptotically without developing life threatening conditions. Relatively mild infections, such as upper respiratory infections due to less pathogenic strains of the feline herpesvirus or feline calicivirus, may become life-threatening. If it is present in a cat with the lymphoplasmacytic stomatitis-gingivitis complex, oral inflammation can be particularly difficult to control. Many of these cats are euthanized due to their inability to eat caused by severe oral pain.<sup>6</sup>

The presence of FIV is diagnosed with an antibody test. It generally takes about 60 days after exposure for the antibodies to be detectable with the ELISA test. However, it has taken up to six months for the ELISA test to become positive in a few cats. Further testing with IFA or Western Blot tests does not offer increased sensitivity or specificity. Testing with Polymerase Chain Reaction (PCR) is recommended to distinguish between vaccinated and infected cats; it will only be positive in the latter. PCR sensitivity is about 90%, and specificity is 100%.<sup>7</sup>

Contagion is problematic with both FeLV and FIV infected cats. Cats in direct contact with them are at risk. FeLV infected cats generally die within two years of infection, but FIV infected cats often live up to 10 years. Thus, the FIV infected cat usually has many more opportunities to transmit the virus to other cats.<sup>8</sup>

## Materials and Methods

To demonstrate the sensitivity and specificity of the Abaxis VetScan® FeLV/FIV Combo Test Kit, feline blood samples were collected from private practices,

shelters, and laboratories. Samples from 233 cats were collected for the FeLV antigen test; samples from 224 cats were collected for the FIV antibody test. The samples were tested using the VetScan tests, commercially available immunofluorescence assays (IFA), and a commercially available test kit. For our analysis below, only samples which were positive by both IFA and the commercially available test kit were considered true positives, while only samples which were negative by both methods were considered true negatives. Please see the results of this testing below.

## Results

In the validation study, the following results were observed:

### FIV

Results	VetScan FIV Rapid Test Negative	VetScan FIV Rapid Test Positive
<b>Negative</b> based on negative criterion	107	3
<b>Positive</b> based on positive criterion	1	113

**Sensitivity: 99% (95% CI: 92 - 99%)**

**Specificity: 97% (95% CI: 92 - 99%)**

### FeLV

Results	VetScan FeLV Rapid Test Negative	VetScan FeLV Rapid Test Positive
<b>Negative</b> based on negative criterion	139	1
<b>Positive</b> based on positive criterion	4	89

**Sensitivity: 96% (95% CI: 89 - 99%)**

**Specificity: 99% (95% CI: 96 - 100%)**

## Discussion

FeLV and FIV testing is not only performed on patients with appropriate clinical signs, but it is also used for screening during well patient visits. It is recommended that patients that test positive for FeLV be verified with a second ELISA test two weeks later or with an IFA test three weeks later if recent infection is possible.

Kittens under six months that test positive for FIV may have residual maternal antibodies; these patients should be retested again after six months of age. If clients decline PCR testing, patients may be re-tested 3-6 months later. During the inter-test interval, potentially infected cats should be isolated from other cats to prevent possible virus transmission.

## Conclusions

The Abaxis VetScan FeLV/FIV Rapid Test has a simple three step method which allows for quick ease of use on plasma, whole blood or serum. The results may be read within 10 minutes and the test is competitively priced.

This study demonstrates that the Abaxis VetScan FeLV/FIV Rapid Test is a highly sensitive and specific point-of-care test that detects the presence of FeLV antigen and FIV antibody. In addition, it is cost effective and easy to use.

## References

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