

## To Test or Not to Test

### Confronting feline leukemia and feline immunodeficiency virus

BY LILA MILLER, D.V.M.



Just because a cat tests positive for FIV or FeLV doesn't mean he has a clinical disease; it only points to possible infection. Tests are not always accurate, and no healthy cat should be euthanized based on the results of only one. DAN BRANDENBURG/ISTOCKPHOTO.COM

Feline leukemia (FeLV) and feline immunodeficiency (FIV) viruses are always near the top of the list when shelter workers discuss diseases of concern. Despite the more devastating effect that upper respiratory infections, ringworm, and feline distemper can have on the shelter's feline population, FeLV and FIV always seem to generate greater discussion, due to the fact that both diseases cause life-threatening problems, and diagnostic testing is required to detect infection.

Luckily, shelter outbreaks of FeLV or FIV are not common because the viruses are not highly transmissible, cause chronic infection rather than acute disease, do not survive outside the body long-term, and are easily killed by disinfection. And in shelters increasingly able to find homes for animals with health issues, positive results on an FeLV and FIV test may no longer constitute automatic cause to euthanize otherwise healthy individuals. Studies have shown that with good preventative health care, some FeLV- and

FIV-infected cats can live for many years after diagnosis.

Deciding whether to use your shelter's scarce resources to test for these diseases can be difficult. In order to make the appropriate choice, shelter managers and veterinarians should review current information about these two retroviruses, including the transmission, prevention and control, diagnostic testing protocols, and methods of caring for infected or test-positive animals in the shelter.

#### **Feline Leukemia Virus: A Common Killer**

This complicated disease was first reported in 1964, and has been one of the most widely researched infectious feline diseases. FeLV occurs worldwide, and although prevalence varies according to geographic region, it remains one of the more commonly diagnosed causes of disease and death in domestic cats. The virus is shed in many bodily fluids, including urine, saliva, milk, tears, and blood, and in feces. It is most commonly transmitted by prolonged



Lila Miller is the ASPCA's vice president of veterinary outreach and veterinary adviser.

direct oro-nasal contact between cats, mutual grooming, and shared contaminated water bowls and litter boxes. It can also be transmitted across the placenta, through contaminated needles, via fomites (hands or inanimate objects that act as virus-bearing surfaces), by nonsterile surgical instruments or contaminated blood transfusion. Young kittens and cats less than 1 year old are the most susceptible; healthy young adults are less infectable. FeLV does not live long outside the body and is readily inactivated by most disinfectants.

Many cats who are in the early stages of infection show no obvious clinical signs. Often, symptoms of feline leukemia infection can be vague and nonspecific, and can include vomiting, loss of appetite and weight, lethargy, and anemia. Since FeLV can be a primary cause of leukemia or lymphoma—both cancers that can affect multiple organs—as the infection progresses, symptoms that correlate with the affected organ system may be observed. For example, if the liver is affected, jaundice and liver enlargement might be seen;

Test brands vary widely in their sensitivity and specificity, and the shelter should always bear in mind that no test is accurate 100 percent of the time under all conditions. It is always recommended to closely follow the manufacturer's instructions for test performance and storage.



Since vaccination or maternal antibodies will not interfere with the test, cats of any age can be tested for feline leukemia. MONIQUE RODRIGUEZ/ISTOCKPHOTO.COM

in the case of brain lesions, seizures, blindness, and behavior changes may occur. FeLV-infected cats may be susceptible to other infections because infection suppresses the immune system; they commonly succumb to other diseases.

The first FeLV vaccine became available almost 20 years ago, and there are several vaccine products on the market today that help protect cats from infection. Of the vaccines currently available, all are inactivated (killed) products that are neither capable of causing disease nor replicating, and they do not interfere with diagnostic testing. The vaccines are not 100 percent effective in preventing infection, but they can significantly help cats at risk. Individual cats should be tested prior to vaccinating because the ability to identify and isolate infected cats is considered the most effective means of protecting a population of cats against exposure. Vaccination will not reverse the FeLV-positive status, nor will it prevent the development or transmission of disease.

#### **FIV: The Feline AIDS**

FIV is responsible for a fatal disease syndrome in cats that is similar to HIV infection in humans. It is often referred to as "feline AIDS," and has not been found to be contagious to humans or other animals. Because the virus affects the immune system, viruses, bacteria, protozoa, and other disease organisms can cause severe illness in FIV-positive cats. This is obviously a big concern for shelters, where the risk factors for exposure to disease increase dramatically. As with HIV, cats can test FIV-positive years before showing any outward signs of clinical illness.

When symptoms do occur, they can be varied and vague, ranging from fever and lethargy to enlarged lymph nodes and cancer. FIV is transmitted primarily through bite wounds and is therefore much more common among outdoor, intact male cats who are most likely to fight. For this reason, FIV may be found more commonly in adult males than kittens or adolescents. On rare occasions it may also be transmitted from mothers to kittens during birth and through nursing. Like FeLV, the disease is found worldwide,

but prevalence varies geographically. Fortunately for shelters, the virus does not survive longterm outside the body and is easily killed by routine disinfection.

In July of 2002, the first licensed vaccine against FIV was introduced in the United States. This is a killed product. It is not 100 percent effective in preventing infection but may have use for cats in high-risk settings like shelters. Once administered, a cat will test positive on an antibody test, so determining the FIV status prior to vaccination and documenting the vaccination status of cats is extremely important.

#### **Is it Time to Test?**

When making a decision about testing for any disease, there are several key things to consider. If testing is going to be performed in a shelter, achieving an accurate diagnosis is especially important, since test results often result in life-and-death decisions. The sensitivity and specificity of the test should be understood. The cost of testing in relation to the information gained should be evaluated. Finally, what will be done with the resulting information? Will it be used to make a definitive diagnosis—even though no single test is 100 percent perfect—or will confirmatory testing be performed? Will it be used to protect other animals' health? Will it be used to determine adoptability?

In the case of both viruses, there are many brands and types of FeLV tests available. One commonly used by shelters is the ELISA (enzyme linked immunosorbent assay) test. This test is typically used for detecting FeLV antigen and FIV antibody. Test brands vary widely in their sensitivity and specificity, and the shelter should always bear in mind that no test is accurate 100 percent of the time under all conditions. It is always recommended to closely follow the manufacturer's instructions for test performance and storage. In most circumstances, testing with serum or plasma yields more reliable results than testing with whole blood, saliva, or tears.

When performing tests, the prevalence of the diseases in the local community must be considered in relation to the



test results. Prevalence of both FIV and FeLV has been found to be as low as 1 to 3 percent in healthy, free-roaming cats in the United States. In cats with health issues (bite wounds and abscesses), the prevalence increases. When a negative test result is obtained in an otherwise healthy cat using a test with good sensitivity and specificity, odds are good that the result is correct. When a positive test result is obtained from a seemingly healthy cat, it can indicate either that a cat is infected, or the test result may be a false positive.

Shelters must decide what to do if they get a positive result in an asymptomatic cat, understanding that it could be a false positive. There are confirmatory test methods for both FeLV and FIV recommended by the American Association of Feline Practitioners for every positive ELISA test, but not every shelter will be able to hold cats while awaiting confirmatory results. Contradictory results may still be found, and the cost of confirmatory testing may be prohibitive.

### Shelters and FeLV Testing

- Cats with clinical signs of illness who test positive do *not* necessarily have clinical illness related to FeLV—it could be something else!
- To confirm positive test results: 1) Another brand of test can be used initially to double check the first result; 2) an immunofluorescent antibody test (IFA) can be performed; 3) other tests, such as PCR, are available and can be utilized.
- Confirmed positive test results indicate infection but do not equate with clinical disease.
- Vaccination and maternal antibodies do not interfere with the test, so it can be performed on cats at any age (although newborns may not test positive for several weeks).
- Queens and each member of a litter should be individually tested.
- After a potential leukemia exposure, it can take a variable amount of time for testing to reveal a positive result. A minimum of 28 days is recommended before testing, and if an exposed cat

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Deciding whether to use your shelter's limited resources on testing for FIV and FeLV can be difficult. It's important to consider how the test results will be used—whether the purpose is making a definitive diagnosis, determining adoptability, or protecting other animals' health. OBSERVEPHOTO/ISTOCKPHOTO.COM

tests negative, serial retesting at 30-day intervals is recommended.

- Discrepancies between ELISA and IFA test results may reflect differences in the stage of disease. Conflicting test results should be discussed with a veterinarian and the testing laboratory before a final decision is made about a cat's health.

### The lowdown on FIV testing

- Cats who are very debilitated may be unable to produce any antibodies, which would yield a negative test result although the cat has the disease.
- Infected mother cats can pass their antibodies to their kittens, so kittens who are tested before 6 months of age may actually test falsely positive until their mother's antibodies are eliminated from their bodies at around that age. So unlike the feline leukemia test that can be performed at any age, FIV testing that is performed before 6 months of age should be repeated at 60-day intervals if a positive result is obtained.
- It may take eight to 12 weeks after an FIV exposure to produce detectable levels of antibodies, so it would be prudent to retest exposed cats 60 to 90 days after the exposure.
- To confirm positive results: 1) Another brand of test can be used initially

to double check the first result; 2) a Western Blot test is considered confirmatory if positive.

### Management in shelters

FeLV/FIV screening tests should be a priority in shelters that:

- group house cats;
- treat infectious disease;
- house cats long term, especially cruelty and other legal cases;
- neuter prior to adoption, as opposed to at adoption. Given that FeLV/FIV positive cats may be more difficult to rehome, shelters may want to consider whether to invest in the surgery, and should keep in mind that the occasional post-operative infection may be more difficult to treat in an FeLV-positive animal.

Shelters that are involved in trap-neuter-return programs for management of feral cats often face the dilemma of whether or not to perform FeLV and FIV tests. Many programs, such as Operation Catnip (operated by the University of Florida) and the ASPCA in New York City, have chosen not to test but to utilize the money saved to perform more spay/neuter surgeries. The decision not to test is based on a variety of factors: the low prevalence of infection in free-roaming

populations, the fact that neither virus is highly transmissible, the inability of the viruses to live outside the host very long, and the inability of most programs to perform tests that confirm positive results on healthy animals.

If a decision is made to test and house FeLV- and FIV-positive cats in the shelter, several precautions should be observed.

- These cats should be isolated from uninfected cats and housed individually or in stable colonies in which fighting is unlikely to occur.
- FIV-positive cats should not be housed with FeLV-positive cats.
- Extra sanitation measures should be observed, such as more frequent hand washing and disinfection, with staff wearing disposable aprons and utilizing disposable rags, towels, etc. when cleaning areas housing these animals. Although the diseases are short-lived outside the animal's body, fomite transmission is still possible, and care must also be taken to not expose these cats to infectious disease from the uninfected cats.
- Stress should be minimized.
- These animals should be vaccinated with the FVRCP vaccine, dewormed, treated for external parasites, and neutered.

### Advice for Adopters

Whether a shelter performs the initial tests or not, adopters should be advised about these diseases and informed that establishing and tracking the FeLV/FIV status of their new cat is an important part of preventive health care. Due to the incubation period of these two retroviruses, repeating a second FeLV/FIV test 60 to 90 days after the cat has entered a stable environment is a good idea.

If adopting a retrovirus-positive cat, adopters should be fully informed about the disease in question and the risks the infection may pose to uninfected cats already in the household. Adopters must be advised that positive cats should be confined indoors, both to prevent spreading the disease to other cats and to keep themselves from being exposed to other animals that may be carrying infectious disease. They must be fed a



nutritionally complete feline diet, and hunting, raw foods, and unpasteurized milk should be avoided.

Routine, semi-annual visits to the veterinarian should be scheduled, with particular attention paid to oral health. Any illnesses or abnormalities should be reported to the veterinarian promptly; remember that these animals are likely to be immune-compromised, and response to therapy may take longer. The adopter may also be advised to weigh the cat regularly since weight loss may be one of the first signs of a problem.

**In the Shelter’s Hands**

The American Association of Feline Practitioners (AAFP) recommends that the FeLV and FIV status of every cat should be known. Its guidelines also state that **no healthy cat should be euthanized based on the results of one single test.** In an ideal world, all shelter cats would be routinely screened in accordance with these guidelines, and their disposition based upon repeated confirmatory testing of healthy animals with suspicious results.

However, I believe the individual shelter should decide whether determining the status of every cat prior to adoption is the best use of its limited resources. A positive test only indicates that the cat may be infected with the virus, not that he or she has clinical disease, and the tests are not 100 percent accurate all of the time.

Many shelters cannot afford to hold otherwise healthy animals for retesting, and any positive result, regardless of the health status of the animal, can result in euthanasia. In shelters that euthanize animals for space and disease, it is a questionable use of resources to test all adoptable cats, but then perhaps euthanize the animal a few days later just because a new home cannot be found right away. Ultimately, since resources are limited, shelters must decide which animals to test, when to test, how test results will be used, and what the risks and the benefits in testing a population of healthy cats with low prevalence of disease might be. AS

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