

# TO TEST OR NOT TO TEST

## *Is Testing for FeLV and FIV in Feral Cats Always Necessary?*

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**T**he protocol for veterinarians treating feral cats is relatively standard since most ferals are healthy and require only sterilization, vaccination, and worming. The hundreds of clinics across the country that treat ferals may differ only slightly in their procedures.

Many people request a blood test for feline leukemia virus (FeLV) and/or feline immunodeficiency virus (FIV) prior to surgery. The veterinarian frequently offers euthanasia of cats testing positive as the only option, regardless of whether the cat is symptomatic (displaying signs of illness) or asymptomatic.

Contrary to common assumptions about feral cats, there is no evidence to suggest that the majority of feral cats are in poor health or are any more likely to be infected with FeLV or FIV than domesticated cats. Certainly, kitten mortality is high—at least half of all feral kittens born never reach adulthood. If they do, their immune systems are able to fight off most viral and bacterial infections. Studies show that between 1 and 5 percent of the domestic (socialized) cat population in the U.S. is infected with FeLV or FIV. When sick and “high risk” pets are tested, the infection rate is much higher: 13 percent for FeLV and 7 percent for FIV. Available data indicate that approximately 4 percent of feral cats are infected with FeLV and FIV. So how important is it to test feral cats for FeLV and FIV? The answer depends on a number of considerations.

The decision to test or not should be based both on the goals of the humane management program and the welfare of the individual cats. The enormous tragedy of overpopulation is what prompted Alley Cat Allies and similar groups and individuals all over the country to start large-scale sterilization programs for feral cats. Controlling breeding through nonlethal means is and has always been the overriding goal of all of these programs. In addition to controlling breeding, neutering has the added benefit of improving the

quality of the cats' lives by reducing or eliminating behaviors like fighting, mating, and roaming that put them at risk of becoming injured, getting killed, or contracting FeLV and FIV.

Before making a decision about testing, it is important to assess the cats you are planning to trap and formulate a management plan. Are the cats truly feral or are they stray? Will the cats go back to the colony or, if stray or tamable, be homed? Clearly, tamable kittens and strays should be tested before being placed in foster or adoptive homes. But what about untamable adults who will be returned to the colony site? Testing may be warranted in some situations and not in others. Testing a colony with a high mortality or disappearance rate and/or obviously unhealthy members may be appropriate, whereas testing an apparently healthy, flourishing colony may be unnecessary. Also essential to the decision-making process is an adequate understanding of the nature of both viruses and the limitations of the tests used to detect them.

### **FELINE LEUKEMIA VIRUS (FeLV)**

Feline leukemia virus is a retrovirus belonging to the oncornavirus subfamily, which means it is a cancer-causing virus. In addition to causing feline leukemia, FeLV causes severe anemia and suppresses the cat's immune system, leaving the animal vulnerable to a variety of opportunistic diseases.

Infected cats shed FeLV primarily in their saliva, although the virus is also present in the blood, tears, feces, and urine.

Most cats acquire FeLV from their infected mothers. Other modes of FeLV transmission include mutual grooming, sharing food dishes, and fighting.

Fortunately, FeLV cannot survive very long outside a cat's body. The virus loses its infectivity within minutes or hours if left at room

temperature, and it can easily be destroyed with most disinfectants and detergents.

### ***How FeLV exposure affects a cat***

One of three things can happen when a cat is exposed to FeLV. The cat may experience a transient viral infection and then fight off the virus, developing future immunity. There is evidence that up to 70 to 80 percent of adults exposed to FeLV survive the initial stage of infection and acquire immunity. Kittens under 16 weeks are much less likely to overcome a viral attack.

If the cat does not overcome the initial infection, the virus eventually moves to the bone marrow, and the cat becomes persistently infected, or viremic. Even though a persistently viremic cat may be asymptomatic for several years, he or she will usually develop FeLV-related diseases at some point. Persistently infected cats shed the virus throughout their lives, becoming a source of infection for other cats with which they come in contact.

A third possibility is that the cat is able to produce an effective immune response to the infection yet continue to harbor the virus somewhere in the body. A latently infected cat does not appear to be susceptible to FeLV-related diseases and does not shed the virus the way a persistently infected cat does, so there is no risk of infecting other cats. The latent phase of a FeLV infection seems to be temporary for most cats, which become free of the virus within a few years after the infection occurs. However, latently infected cats do occasionally become persistently viremic.

### ***Testing for FeLV***

There are two types of blood tests available for detecting FeLV: immunochromatic tests and the immunofluorescence assay (IFA). The immunochromatic tests, such as the ELISA, detects the presence of FeLV during the initial, or transient, stage of infection, whereas an IFA test detects the virus during the second stage, after the bone marrow has become infected (an ELISA can also detect the virus at this stage). Immunochromatic tests can be performed in a few minutes at a veterinary clinic.

Since it is possible for an ELISA to register a false positive result, a cat that tests positive should be retested in 8 to 12 weeks, using either an IFA test alone or a second immunochromatic test followed by an IFA test. A cat exposed to FeLV may test positive during the transient phase of the infection and then test negative if the virus is overcome. It is likely that some cats euthanized because of a positive test result were tested during this phase and would have eventually overcome the infection. A cat that tests positive using an IFA will likely remain positive for life.

Note that a cat in the initial stage of FeLV infection may actually test negative. To avoid a false negative test result on an infected cat, test the cat at least 28 days after the cat's last possible exposure to the virus. Unfortunately, there is no test available to detect a latent FeLV infection.

### ***Treatment***

Although there is no known cure for FeLV, supportive care—including good nutrition, minimization of stress, and prompt treatment of illness—can improve the health of and prolong the life of FeLV-infected cats. New treatments known as immunotherapies are said to boost an infected cat's weakened immune system. These therapies are popular, but their effects are largely unproven. For more information about immunotherapy, visit "Feline Leukemia (FeLV) Treatments Page" at [www.angelfire.com/il/felv](http://www.angelfire.com/il/felv).

## **FELINE IMMUNODEFICIENCY VIRUS (FIV)**

Feline immunodeficiency virus, like FeLV, is a retrovirus. FIV is in the lentivirus subfamily. FIV results in suppression of the cat's immune system, compromising the animal's ability to fight off infection. FIV-infected cats are vulnerable to a wide array of bacteria, viruses, and fungi that normally are harmless to a healthy animal.

Fortunately, FIV does not seem to be transmitted as easily as FeLV. Evidence suggests that the primary mode of transmission is through bite wounds. This explains why the cats most likely to become infected are free-roaming, unneutered males prone to territorial fighting. FIV does not appear to spread easily through casual contact among cats, so it is possible to keep an

FIV-infected cat in the same household as a healthy cat with little risk of transmission, provided the cats tolerate each other and are not fighting. It is important to note that kittens are unlikely to acquire FIV from an infected queen, either through in utero transmission, maternal grooming, or nursing.

### ***Progression of the virus***

After initial infection, the virus spreads to the cat's lymph nodes, causing them to become enlarged. The cat may develop a fever that lasts for several days and may experience a drop in the white blood cell count. During the second stage of infection, the cat can be completely asymptomatic and remain healthy for up to several years. During the third, chronic stage, the cat begins to develop signs of immunodeficiency and may suffer from a number of secondary conditions and opportunistic infections, including stomatitis, ocular inflammation, cancer, and respiratory tract infections. FIV-infected cats can also develop persistent intestinal and urinary tract infections, neurological problems, kidney disease, and tumors.

A diagnosis of FIV is not necessarily cause for alarm. Since the virus has a relatively long incubation period, a cat that tests FIV positive may live happily and healthily for several years.

### ***Testing for FIV***

Infection can be detected by testing for the presence of FIV antibodies. In some cases, detectable FIV antibodies may not appear until 8 to 12 weeks after exposure. The IDEXX SNAP test can be used to detect FIV antibodies (a SNAP combination kit can test for both FeLV and FIV using the same blood sample). Since false positive results do occur, a positive test should be confirmed with a second test, preferably with a more specific test like the Western blot (WB). The WB (or immunoblot) test also detects the presence of FIV antibodies, but is more time-consuming than the ELISA and requires laboratory analysis. Remember that kittens that test positive are not necessarily infected. If a kitten tests positive, the test is probably detecting antibodies passed from an infected mother to the kitten through colostrum. Positive kittens should be

retested between 4 and 6 months of age, when any antibodies obtained from the mother cat will have disappeared.

In 2002, the first FIV vaccine was approved. Fel-O-Vax FIV results in antibodies that are indistinguishable from those that occur with natural infection. Therefore, it has become difficult to know which cats are infected with FIV, vaccinated against FIV, or both infected and vaccinated.

### ***Care and treatment***

Although there is no cure for FIV, veterinarians can treat or at least alleviate the secondary conditions and opportunistic infections associated with the virus. And good supportive care can improve the quality of an FIV-infected cat's life. Holistic veterinarians recommend nutritional support, herbs, vitamins, homeopathy, and other alternative treatments such as acupuncture to help strengthen an animal's impaired immune system. For more information about holistic treatments, see *The New Natural Cat*, by Anitra Frazier (also provides information about treating FeLV) and *Dr. Pitcairn's Complete Guide to Natural Health for Dogs and Cats* by Richard Pitcairn, DVM, and Susan Hubble Pitcairn.

More complete information about selection and interpretation of FeLV and FIV tests and management suggestions for infected cats are available from the American Association of Feline Practitioners at [www.aafponline.org/pdf/guidelines\\_retrovirus\\_testing\\_2001.pdf](http://www.aafponline.org/pdf/guidelines_retrovirus_testing_2001.pdf)

### **FELV AND FIV TESTING IN HIGH VOLUME SPAY/NEUTER PROGRAMS**

In 1991, ACA formed guidelines for veterinarians and caregivers working with feral cats that included a recommendation to test the first 20 to 25 percent of the colony and to test a mother cat to determine the status of her kittens. Many programs have evolved since that time, including large-scale feral cat spay days like those run by Operation Catnip in North Carolina and Florida, AzCATs in Arizona, the Feral Cat Coalition in San Diego, and ACA in the Washington, DC area. Experience has led many of those involved in these and similar programs to question the

efficacy of testing feral cats for FeLV and FIV. Some have even chosen to discontinue testing of feral cats altogether. The factors they considered in deciding not to test included:

1. The percentage of feral cats infected with either FeLV or FIV is low. Approximately 4 percent are infected with FeLV and 4 percent with FIV. This is similar to the infection rate in pet cats.
2. Sterilization contains the spread of viruses like FeLV and FIV. Since neutering reduces or eliminates the primary modes of transmission, such as fighting and breeding, infected cats pose little risk to other cats.
3. Infected cats are often asymptomatic and can remain healthy for several years. In addition, because testing is not always accurate, healthy cats may be euthanized unnecessarily when positive test results occur. Moreover, removing and euthanizing a cat that tests positive will not necessarily prevent spread of the infection

within the colony since it's likely that the other colony members have already been exposed to the virus.

4. In some circumstances, the cost of testing may outweigh its effectiveness and even hinder the success of a sterilization program (see interview with Dr. Levy, following). The effectiveness of these large-scale sterilization programs indicates that the goal of spaying and neutering as many ferals as possible can be met without compromising the health or well-being of the cats. It is important to remember that we are in the midst of a crisis. Shelters all over the country are killing stray and feral cats at an alarming rate. We need to focus our energy and resources on preventing the births of more homeless kittens, most of whom don't survive their first year of life. Increasing the number of animals who are spayed and neutered is the single most effective way to help control the crisis and reduce the suffering of stray and feral cats.

## REFERENCES & RESOURCES

- Lee IT, Levy JK, Gorman SP, Crawford PC, Slater MR. Prevalence of feline leukemia virus infection and serum antibodies against feline immunodeficiency virus in unowned free-roaming cats. *J Am Vet Med Assoc* 2002;220:620-622.
- Levy JK, Richards J, Edwards D, Elston T, Hartmann K, Rodan I, Thayer V, Tompkins M, Wolf A. Feline Retrovirus Testing and Management. *Comp Continuing Ed Practicing Veterinarian* 2001;23:652-657,692.
- Levy JK. Feral Cat Management. In: Miller L, Zawistowshi S, eds. *Shelter Medicine for Veterinarians and Staff*, Blackwell Publishing, 2004, 377-388.
- "Fighting FeLV," *Catnip*, Tufts University School of Veterinary Medicine, June 1997.
- "Report on the Petworth Animal Hospital Feral Cat Program," Alley Cat Allies, September 10, 1997.
- "The Health of Feral Cats vs. Pet Cats in Davis, CA," Proceedings of the Public/Private Strategies for Cat Population Control Conference, June 21-22, 1997, Denver, CO.
- "Feral Cat Co-op Report," Peninsula Humane Society, April 1996.
- "FIV: Separating Facts From Fears," *Catnip*, February 1994.
- "FeLV: Where Are We Today?" *Catnip*, September 1994.
- *Feline Husbandry: Diseases and Management in the Multiple-Cat Environment*, Niels C. Pedersen (Mosby, 1991).
- *Cornell Book of Cats*, Cornell Feline Health Center (New York: Villard Books, 1989).

# OVERPOPULATION KILLS MORE CATS THAN DISEASE

## Introduction

Much concern exists over the feline leukemia virus (FeLV) and feline immunodeficiency virus (FIV). Many people feel allowing cats to continue to live after testing positive is not a humane option. Thus, these people sentence positive cats to death with the misguided intentions of preventing the virus from spreading and the cat from suffering. But evidence shows that many positive cats can live normal lives for several years without many symptoms. What's more, blood tests aren't 100 percent accurate, so many cats who test positive really are not, but still are killed.

Despite the concern over viruses, no feline disease ends more lives than overpopulation. Bringing feral cat populations under control requires the implementation of high-volume sterilization programs. These programs also benefit cats by reducing the spread of viral infections.

## Sterilization helps prevent the spread of viruses

The primary means of transmission is through unneutered male cats fighting for mates, sexual activity, and from mother to kittens. Since resources are limited, difficult decisions have to be made about how to control feral cats most efficiently.

Dr. Julie Levy is the founder of Operation Catnip (OC) in Gainesville, Florida, and Raleigh, North Carolina. OC has sterilized more than 20,000 feral cats since 1997. OC's mission is to reduce the population of feral cats by sterilizing as many as

possible. Therefore, Operation Catnip veterinary staff do not test for FeLV or FIV before they sterilize feral cats. Dr. Levy believes program leaders must consider the consequences of each policy decision made. Will testing cats reduce the number sterilized? Will returning sterilized infected cats reduce the spread of disease?

At one time, OC's Raleigh, North Carolina, chapter did test and euthanize all positive cats regardless of their physical condition. Testing 733 cats yielded a 5 percent FeLV and 2 percent FIV infection rate. OC also tested 330 house cats and strays from a shelter and found no significant difference between owned and stray cats and the incidence of FeLV and FIV (7 percent FeLV and 6 percent FIV positive in stray cats; and 5 percent FeLV and 6 percent FIV positive in house cats).

## Is not testing a wise policy?

Dr. Levy's model below shows the effectiveness of sterilizing a greater number of cats over testing and neutering or not doing anything at all. Sixty-five percent of OC's cats are female.

The model makes two assumptions:

1. Female cats produce 6 kittens a year.
2. 75 percent of an FeLV-infected queen's kittens also become infected.

The model does not include an estimate for horizontal transmission of the virus, which is less common.

	Model 1	Model 2	Model 3
	No sterilization No testing	Sterilize 1,000 cats Remove FeLV+	Sterilize 2,000 cats No testing
Percent FeLV+	4%	4%	4%
Adults sterilized	0	1000	2000
Adults left intact	2000	1000	0
FeLV+ euthanized	0	40	0
Adults left FeLV+	80	40	80
Kittens born	6000	2880	0
FeLV+ kittens	180	86	0
Total FeLV+ cats	260	126	80

# INTERVIEW WITH *OPERATION CATNIP'S* JULIE LEVY

**A**lley Cat Allies interviewed Dr. Julie Levy and asked her about Operation Catnip and its policy on testing feral cats for FeLV and FIV. Dr. Levy graduated from the School of Veterinary Medicine at the University of California at Davis in 1989 and received a PhD in the immunopathogenesis of FIV infection in cats in 1997. Dr. Levy is a member of the American College of Veterinary Internal Medicine and is currently an associate professor with the small animal medicine service at the University of Florida.

Dr. Levy's research and clinical interests center on feline infectious diseases, neonatal kitten health, and humane alternatives for cat population control. She is the founder of two university-based feral cat spay/neuter programs that have sterilized more than 20,000 cats since 1997 (Operation Catnip). These programs form the basis for research on a variety of feral cat issues, including infectious diseases, caretaker characteristics, colony dynamics, and anesthesia protocols. Dr. Levy also maintains an active program investigating vaccines for potential immunocontraception in cats.

**ACA:** Tell us a little about Operation Catnip and its relationship with the Colleges of Veterinary Medicine in North Carolina and Florida.

**Dr. Levy:** Each site has one clinic a month. The clinic staff consists of approximately 50 volunteers: 5-10 veterinarians, the rest veterinary students, veterinary technicians, and cat lovers. We spay/neuter 100-130 cats per clinic. The cats are 3 months old and older. The benefits of the partnership between the College of Veterinary Medicine and Operation Catnip include valuable hands-on experience for veterinary students, public service to the community, and enhanced public image of our spay/neuter program. The collaboration also provides an excellent opportunity for good research on feral cats (specifically on Trap-Neuter-Return) which is so lacking here and elsewhere. Several research laboratories at the school utilize the tissues discarded at surgery, thus reducing the number of animals purchased for research.

**ACA:** What percentage of the ferals (from OC) has tested positive for FeLV and FIV?

*“We realized that a lot of our money and efforts were going into areas that did not increase the number of cats sterilized. Testing was just one of these activities. Of the \$16 we spent on each cat, \$11 went to testing. Because the infection rate was low, we were spending about \$200 to identify each positive cat. That \$200 could have funded sterilization of 40 more cats.”*

**Dr. Levy:** In North Carolina, 5 percent of our feral cats are FeLV positive and 2 percent are FIV positive. This is typical for other areas of the country and for pet cats.

**ACA:** Why did you (and the board of OC) decide to stop testing feral cats for FeLV and FIV?

**Dr. Levy:** Lisa Kaplan and I spent a day in San Diego with the Feral Cat Coalition. Although our goals were the same, to spay and neuter as many cats as possible, their program was much more efficient in terms of the number of cats sterilized and the cost/cat. We took a hard look at the differences between our programs. We realized that a lot of our money and efforts were going into areas that did not increase the number of cats sterilized. Testing was just one of these activities. Of the \$16 we spent on each cat, \$11 went to testing. Because the infection rate was low, we were spending about \$200 to identify each positive cat. That \$200 could have funded sterilization of 40 more cats. An entire volunteer station was devoted to collecting blood and running tests. Finally, the euthanasia of healthy positive cats created an ethical problem for some of the caregivers and volunteers who felt that they were betraying the cats.

*“There is a common perception that feral cats have a higher rate of FeLV and FIV than do pets. Our research on more than 1,000 feral and pet cats in California and North Carolina, and published research in the veterinary literature show that this is not true.”*

**ACA:** Do you feel that not testing will have an adverse result in managed colonies?

**Dr. Levy:** Our general experience has been that the infection rates in colonies are low. However, we have had a few in which up to 30 percent of the cats were FeLV positive. This is more likely to occur in large colonies in which a lot of kittens are being produced. Ironically, we have seen this occur most frequently in colonies fed, but not sterilized, by a well-meaning caregiver. Presumably the unlimited availability of food and shelter increases the reproductive capacity of the colony, leading to the birth of more infected kittens. The "baby-sitting" behavior of queens also leads to the spread of FeLV. It is very common for the nursing litters to be cared for communally. Since FeLV can be spread through the milk, or even from infected kittens to the queens that care for them, the simultaneous presence of multiple litters favors the spread of FeLV. It may be

reasonable to test cats from unthrifty colonies. Certainly kittens removed for taming should be tested before being placed in new homes. One recommendation that is not logical is to test a sample of the colony for the presence of these viruses; their prevalence is too low for representative sampling to be valid.

**ACA:** Do you feel that it is necessary to test ferals who are going to be relocated from their original site to an environment such as a farm or horse stable?

**Dr. Levy:** I would leave the decision of whether to test relocated cats up to the two parties involved. There may be some increased fighting when new cats disrupt the local social structure. On the other hand, are the resident cats also tested and sterilized? My primary recommendation would be to minimize relocation efforts as much as possible.

**ACA:** How do you respond to the concern that untested colonies will pose a risk to companion animals?

**Dr. Levy:** Untested colonies pose no more risks to companion animals than do free-roaming pet cats. There is a common perception that feral cats have a higher rate of FeLV and FIV than do pets. Our research on more than 1,000 feral and pet cats in California and North Carolina, and published research in the veterinary literature show that this is not true. In reality, it is unneutered cats that wander, fight, and reproduce that are most likely to spread these diseases, regardless of whether they are in feral colonies or in private homes. ♦

**Alley Cat Allies (ACA)** — The national information clearinghouse and advocacy organization working to establish effective nonlethal programs, including Trap-Neuter-Return (TNR), as the standard method of reducing feral cat populations. ACA functions through print, video, and web-based information; workshops and conferences; and by consulting with individuals, groups, agencies, and institutions that work directly with feral cats. ACA is a 501(c)3 nonprofit association based in Washington, DC. For more information, go to [www.alleycat.org](http://www.alleycat.org).

**Trap-Neuter-Return (TNR)** — A nonlethal sterilization method to reduce the numbers of feral cats in the environment both immediately and for the longterm. TNR is a comprehensive, ongoing program in which stray and feral cats already living outdoors in cities, towns, and rural areas are humanely trapped, then evaluated, vaccinated, and sterilized by veterinarians. Kittens and tame (stray) cats are adopted into good homes. Healthy adult cats too wild (feral) to be adopted are returned to their familiar habitat under the lifelong care of volunteers. Cats that are ill or injured beyond recovery are not returned to the environment.



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**Alley Cat Allies** • 7920 NORFOLK AVENUE, SUITE 600 • BETHESDA, MD 20814-2525  
ALLEYCAT@ALLEYCAT.ORG • WWW.ALLEYCAT.ORG