FeLV, FIV, and FIP - frequently asked questions!

FeLV -Prevalence:

In most of the published studies samples were already pre-selected and do not represent the total cat population. For a veterinary surgeon on the other side it is important to know the prevalence and incidence of an infectious disease. Thus, we share our data with you:

In 2003 we tested 4208 cats for FeLV; 7% showed to be positive. Age or gender correlation did not exist. The prevalence in the United States is published with approximately 4%, in cats with clinical signs it increased up to 21%.

FeLV-Diagnosis:

Usually an antigen-ELISA is used to detect a FeLV-infection. All tests on the market detect the p27-antigen of the virus. They have more or less the same level of sensitivity, but often vary in specificity due to the low prevalence of FeLV in the cat population. Thus, the reliability of a negative result is quite high, but the risk to get a false positive result is statistically around 20%. Especially in the case of questionable results it is advised to confirm positive results with an additional test on a different basis like immunofluorescence or PCR.

Antibody detection is not useful in the diagnostic of FeLV, because of the high proportion of transient infections especially in roaming cats.

Divergent test results in an animal can occur due to:
1. different stages of infection
2. different compartments, like detection of free virus by ELISA, cell associated virus by IFAT or virus material in bone marrow or blood with PCR
3. technical problems with the test

Negative results can be due to:
1. no exposure to FeLV
2. incubation period
3. latent infection
4. abortive form of infection

Vaccination does not interfere with testing. It only induces the production of antibodies to a certain antigen. The common tests always detect an antigen that is not used in vaccines.

FeLV-Biology:

The test detects viremia from day 28. post infection on.

In infected queens it is known that kittens can get infected in uteri. In rare cases it is reported that non-viremic, ELISA negative queens transmitted virus to their offspring. Thus, kittens should be tested regardless of the status of the queen. They can be tested at any time since maternal antibodies do not interfere with the test.

In catteries, where the financial situation is an issue at least the queens should be tested.

FeLV-What can be done when there is a positive cat in the household?

A positive result does not necessarily mean the cat will show clinical signs at the same time. In 60% of the cases cats only get infected transiently. The survival rate of the virus can be very long in these transiently infected cats though.

FeLV gets transmitted by close contact. The virus gets excreted with saliva, urine and faeces.

Grooming, food bowls and litter trays are sources of infection. The best way to protect other animals is to test all cats, and separate the negative ones. Animals can be declared negative after two consecutive negative test results performed two month apart. New animals should be under quarantine before they are included in the household. These cats should be tested twice in this time as well. If it is not possible to separate positive from negative cats, all negative animals should get vaccinated against FeLV. Although the vaccination has a high predictable fraction of protection is does not give 100% security. Anyhow, adult animals are less likely at risk to get infected because there is a natural age resistance.
FIV-Prevalence

In the year 2003 the prevalence of FIV in cats tested in our lab was 4.8 % (n=1688). Thereby tom cats were overrepresented with 5.8% in comparison with females with 3.1%.

FIV-Diagnosis

All commercially available tests antibody tests with ELISA or immunochromatography technology. Due to the low prevalence in the feline population the reliability of a negative result is high. A positive result, especially when not expected, should be confirmed by retesting or a test with a different test design like Western Blot.

Antigen testing, predominantly in the persistent stage of the infection, is not recommended due to the low viral load. The use of PCR analysis currently still bares problems. Because of the variety of subtypes and a high mutation rate of the virus the choice primers is crucial in this field still some developmental work has to be done to establish the PCR for routine diagnostic work.

The new FIV vaccine, licensed in the US, interferes with all tests currently carried out.

FIV-Biology

Cats become antibody-positive around 60 days post infection. Animals with unknown background should therefore be retested in a 60 day interval. Virus is transmitted from an infected queen to most of the kittens and maternal antibodies can be found until 6 month after birth. Thus, final tests of kittens should be performed after the age of 60 days. The high incidence in adult male cats is due to their fighting habits. Transmission by “casual transfer” is reported as well but occurs just in rare cases.

In FIV positive cats a prognosis and a therapy control can be provided by a cellular immunstatus using flow cytometry method.

FIV-What can be done when there is a positive cat in the household?

Ideally positive and negative cats should be kept separate in a household, but in a closed group of cats with an established ranking the risk of transmission is low.

Positive cats should get neutered and kept indoors. A well balanced diet, deworming and a consequent health check gives a positive cat a good live expectancy.

FIV and FeLV

To prevent infection a good hygiene is recommended. Food bowls, beddings and litter trays should be disinfected. A period of 30 days before introducing a new cat in the household is the most important issue.

All animal used as blood donors should be tested on a regular basis and kept indoors. For veterinary practices it is absolutely necessary to autoclave their surgical and dentistry tools and provide a good hygiene after treating a cat positive for either FIV or FeLV.

FIP-What is FIP?

Feline Infectious Peritonitis (FIP) is a fatal disease of cats caused by a genetic mutant of the common Feline Enteric Coronavirus (FCoV).

Clinically cats can develop two forms of the disease: the wet, effusive form and the dry, granulomatous form.

The wet form leads in a severe polyserositis with the development of a yellowish, viscous and fibrinous ascitis fluid. In the dry form organs are infiltrated by granulomas in almost any location. Cats show anaemia, jaundice and pyrexia. Sometimes infected animals develop CNS-signs and uveitis.

FIP-Why do some cats develop FIP?

After an infection with common FCoV the virus replicates in the epithelium of the small intestines. In most cases only mild clinical signs occur, like mild diarrhoea or oral and nasal discharge. In some cats a mutation leads to the FIPV and allows the virus to grow in macrophages. Now the immune system starts to increase the interleukin synthesis and develops immune complexes.

Each mutation in any cat differs from each other, thus there is no way to distinguish between benign and malignant coronaviruses.

How is the transmission of FCoV?

FCoV is shed in saliva and faeces of infected cats. Therefore cats get infected due to shared litter trays and food bowls. A vertical transmission is possible.
FIP—How to interpret a positive antibody titre?

Cats which have contact to any coronavirus develop an antibody titre. This virus is quite common in the feline population and it does not mean that a cat with a high antibody titre will consequently develop FIP, especially when it comes from a multicat household, a breeding colony or a rescue cattery. But it is likely that cats with a titre higher than 1:400 are shedding virus with their faeces.

In a clinically ill cat antibody titres can be low or undetectable because they are all bound in immune complexes.

Aim of an antibody test can be:

- Confirm a negative status before introducing a cat in a seronegative group. Hereby a test with a low cut off should be used, like IFAT.
- Confirm at least an infection in an animal with clinical signs.

FIP—How do I identify cats which are shedding FCoV?

The most effective way to identify cats shedding FCoV is PCR. Cats shedding a high amount of virus have a high mutation rate and thus bear the risk to develop the disease. In addition these animals are supposed to be a risk to infect other animals.

In our lab 54% of samples investigated during routine survey were positive for FcoV, so the PCR is helpful to indeed identify shedding animals. One has to keep in mind though that a positive faecal PCR just tells you a cat is shedding FCoV - not whether is has FIP or will develop FIP in the future.

Is there any therapy for FIP?

Unfortunately no - the use of immunosuppressive drugs such as corticosteroids or cyclophosphamide may slow down disease progression, but does not alter the outcome. The attempt to cure FIV with feline Interferon-omega failed.

Is it possible to diagnose FIP for certain?

No, not in the living animal. But a couple of pieces can lead to narrow down the number of differential diagnosis. Most important parameter is the total protein count, that is increased in most cases (>100G/l). Using a protein electrophoresis it is possible to measure albumin and the globulin fractions. Hypergammaglobulinaemia is a common finding in FIP cats. An albumin/globulin-ration below 0.5 is highly specific (92%) and highly predictable. Haematology is non-specific and variable depending on the severity and progression of FIP and other concurrent problems. Neutrophilic leucocytosis and mild, normocytic, normochromic mainly non-regenerative anaemia are present in many cats.

Is it useful to investigate ascites fluid?

In the wet form of FIP it can be reasonable to aspirate fluid and look for specific gravidity (>1017g/l), increased proteins and concentration of LDH. Cytology shows neutrophils and many macrophages. A easy and reliable test is the Rivalta-test. It is always positive in FIP-cases.

How long should I wait before I can bring another cat into the house?

Coronaviruses are not very resistant in a normal environment. All litter trays, bowls and other items other cats had contact to should be cleaned as thoroughly as possible. Objects that cannot be properly cleaned should be discarded. Normal exposure to air and sunlight will usually destroy coronaviruses within 2 weeks. However, the virus can survive longer within dried litter and faeces.

How to get a FCoV-free cattery?

This is a very difficult task. Especially in multicat households spreading of the virus is more variable due to a higher number of cats using one litter tray and the same food bowl. Hygiene is therefore essential to maintain a low viral load in the environment.

All cats should be tested for antibodies and/or faecal shedding by PCR. Seropositive and seronegative cats should separated. Kittens from shedding queens should undergo early weaning to protect them from infection. All seronegative animals should be vaccinated to minor the risk of infection.