

Nobivac® Bb  
for Cats



# How to control cat 'flu

A guide for breeders and cattery owners



## Introduction

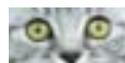


Cat 'flu remains a depressingly common experience, despite the important contribution made by vaccines. The disease can vary in severity, but kittens are particularly at risk and entire litters have been known to die soon after contracting it.

This guide aims to help you control cat 'flu and understand the disease. It should be of benefit to all those who keep large numbers of cats on a single site - and particularly those who breed kittens.

Although it provides some background knowledge to the disease, it is designed primarily to foster an understanding of the problem and act as a practical guide in preventing outbreaks.

We hope that you will find it invaluable.



## What causes the disease?

Despite the name, the causes of cat 'flu bear no relation to those of human influenza. Whereas influenza is caused by a single virus, cat 'flu is a syndrome: the signs of this disease may be caused by one or more of several different infectious agents (pathogens).

However, there are only three known primary pathogens, capable of causing the disease on their own\*. These are the viruses Feline Herpesvirus (FHV), and Feline Calicivirus (FCV), and the bacterium *Bordetella bronchiseptica*. Respiratory disease problems within a household or cattery environment may involve one or more of these infectious agents.

Both of the viruses that cause cat 'flu can only cause disease in members of the cat family. *Bordetella bronchiseptica*, on the other hand, can cause disease in a range of species and, importantly, is the principal cause of kennel cough (infectious tracheobronchitis) in dogs.

Each pathogen behaves in a different way, although many of the signs seen in cat 'flu are broadly similar, irrespective of cause (see "The many faces of cat 'flu" on the back page for further details of what to look out for).

\*Please note: another infectious organism, *Chlamydophila felis* (previously called *Chlamydia felis*) may lead to severe conjunctivitis in cats, but is not responsible for the full range of signs associated with cat 'flu. Discussion of the management of this problem is therefore outside the scope of this guide.

## Why hasn't vaccination brought cat 'flu under control?

Although the vast majority of cat breeders and cattery owners recognise the importance of vaccination's rôle in preventative health care, it is a fact that a significant proportion of cats in the UK are unvaccinated. This is clearly a major reason for the continued incidence of feline respiratory disease.

Where feline calicivirus or herpesvirus is present in a breeding environment, young kittens can easily become infected before vaccination has a chance to be effective. In this situation it is possible to see disease in young kittens despite a comprehensive vaccination policy.

A further reason relates specifically to feline calicivirus infections. The nature of this virus is that it changes form readily. Unfortunately, it is generally recognised that none of the existing vaccines will protect against all calicivirus strains.

Finally, the unique conditions in catteries and breeding colonies may make them ideal situations for the spread of cat 'flu, both within the population and from the



outside. The role of Bordetella in this phenomenon has only recently been understood. Bordetella may be of particular importance in multi-cat environments; where kittens are bred or introduced it can pose a major threat.



## The “carrier state”

Animals that become infected with any of the agents responsible for cat ‘flu may continue to be a risk to other cats, whether or not they show signs of the disease.

This “carrier state” varies, depending on which infectious agent is responsible, but carrier cats are very common in the population. One UK study, for example, suggested that 26% of cats test positive for calicivirus (Binns *et al*, 2000); in another, 11% of all cats tested positive for Bordetella (Binns *et al*, 1999). This carrier state is fundamental to the way in which these infections persist in the population and is why control in the multi cat environment can be problematic.

### Feline herpesvirus carriers

All cats infected with feline herpesvirus are typically infected for life. Following infection - with or without obvious disease - the virus will become latent (hidden) - the cat will show no signs. Following a stressful event (such as a journey, a cat show, fighting with another cat or even another health problem), these latently-infected individuals may start to shed infectious virus again for a variable period.

These periods of shedding may or may not be associated with signs of cat ‘flu. In other words, some are healthy looking or “silent” shedders and one may therefore be unaware that these individuals present an infection risk.

Feline herpesvirus carriers are difficult for vets to spot since samples taken from the cats and sent to the laboratory for analysis rarely identify latent infections. Because of this we don’t really know the true incidence of herpesvirus carriers in the UK. Nonetheless, disease caused by this virus is commonly recognised by vets in practice.

### Feline calicivirus carriers

Cats infected with calicivirus tend to shed the virus continuously for weeks, months or years - and so carrier cats are therefore easier to identify. Most cats are able to stop shedding the virus eventually, but a minority become persistent shedders. In recent years, some cats with chronic gum inflammation (gingivitis/stomatitis) have been shown to be persistently infected with feline calicivirus.

### Bordetella carriers

Carrier cats are also important with respect to Bordetella infections. We know that the bacteria can persist in cats for **at least** 19 weeks after infection, but we do not currently know the upper limit. It may be that our tests are simply not sensitive enough to detect all carriers: for example, infected queens have been shown to have “recovered” enough to produce a negative swab test, and then later begin to shed Bordetella again due to the stress of pregnancy and kitting. This finding is particularly worrying in view of the potential severity of the disease in young kittens. Unfortunately, whilst some antibiotics may have an effect in reducing the signs of Bordetella infection, they do not deal effectively with the carrier state.



## Practical steps to reducing cat 'flu

There is no doubt that vaccination remains a vital tool in protection against cat 'flu. However, because there are limitations in what can be achieved, it is vital to consider other ways of reducing the risk of infection.

### Spread of infection

Susceptible individuals become infected from direct contact with cats showing signs of disease, as well as from carrier cats showing no signs of disease. But infection can also occur from a contaminated environment, because all cat 'flu pathogens can survive for a limited time outside the body.

Airborne (aerosol) infection may occur and therefore good draught-free ventilation is important to ensure that all infectious particles are swept away. However, because cats only have a small lung capacity, sneezing doesn't seem to be a major means by which cat 'flu is spread over longer distances.

### The effect of group size and stocking density

Large groups of cats at high density provide optimum conditions for the spread of cat 'flu infections. The social interactions within such a group may increase stress, further increasing the susceptibility of individuals and also increasing the likelihood that carrier cats may shed infection to others.

Purely from a disease-control point of view, keeping cats individually is ideal, though this is not always practical or desirable in a breeding household. Failing this, cats in small groups of three or less should reduce the opportunity for infection to spread.

### Isolation and quarantine

Ideally any newly introduced cat should undergo a period of strict isolation from all the other cats in the household. Swabs may be taken by the vet to screen for infection, but latent herpesvirus infections will often be missed. The quarantine period is also important because the stress of re-homing may trigger clinical disease and/or virus shedding in a cat that carries herpes virus.

Clearly, the most susceptible individuals - young kittens with their mother - will also benefit from rearing in strict isolation in a separate kittening room. Scrupulous "barrier nursing" is required to prevent cross-infection into such an environment; however even this will not be enough to prevent disease in the kittens if their mother is a carrier.



### Breeding from infected queens

Breeding queens that become persistent carriers of infection are likely to infect and may cause serious disease in their kittens. Practical advice differs, depending on which infectious agent is present, but options may be limited. Detailed discussion is beyond the scope of this booklet and specific advice from your veterinary surgeon should certainly be sought in these circumstances.



### Cleaning and disinfection

Because any cat can potentially be a carrier, any used accommodation should be regarded as contaminated and therefore a potential source of infection for any new cat that is introduced. Cleaning and disinfection of accommodation is therefore very important. Fortunately, both the viruses and Bordetella are susceptible to the common disinfectants recommended for cattery use.

However, because bacteria and viruses may survive within organic debris such as discharges and faecal matter, disinfectants are only fully effective in a clean environment. It is therefore important that cattery accommodation is designed to be easy to clean. For example, an easily washable surface such as a perspex™ “sneeze-barrier” not only provides a physical barrier but is also easier to clean than wire mesh.

When considering cleaning and disinfection, one should not forget that everyday objects such as toys, feeding bowls, water dishes and even carrying baskets may also carry infection. Bowls are easy to keep clean but ideally

should not be used interchangeably between different cats or groups of cats. Wire and wicker baskets are often difficult to keep clean - especially if their condition is poor - so you should consider their replacement with an easily washable design.

Finally, remember that human hands, clothing and footwear may also carry infection. Hands should be washed frequently with an anti-bacterial wash, while protective clothing and overshoes may also be considered when handling different cats.

Herpesvirus only survives in the environment for up to about 18 hours. Calicivirus is hardier and may survive for up to 7 days or longer in damp conditions. But because none of the agents which cause cat ‘flu survive for extended periods in the environment, time is an ally, and if you have the luxury of allowing cattery accommodation to stand empty for a period before re-using, this may be beneficial.

## Vaccination strategies

For kittens, primary course vaccination for calicivirus and herpesvirus is indicated from 9 weeks of age. This is timed to coincide with the decline in antibodies received from the mother's first milk (the so-called maternally-derived antibodies), which might otherwise interfere with vaccination. Two doses are given three weeks apart, and to maintain maximum protection annual boosters are recommended.

A vaccine for *Bordetella bronchiseptica* may also be used, and is particularly suited for young kittens at risk. The vaccine is administered as drops in the nose. Because maternally-derived antibodies interfere less with the effectiveness of nasal vaccination, the vaccine may be administered earlier, from 4 weeks, and its safety has been shown in this age group. 4 weeks of age is actually the most appropriate timing for administration to kittens in an at-risk breeding environment, since it falls prior to the time of highest risk of disease.

Annual re-vaccination against *Bordetella* is advised when adult cats are considered at risk; this would include those remaining within or visiting a multi cat environment including breeding, boarding and rescue catteries, as well as individuals that live with dogs. The risk of *Bordetella* disease in cats kept alone, or in groups of three or less, is low and revaccination of these individuals would not be advised unless exposed to the above risks.



## The many faces of cat 'flu:



1. Large ulcer on the tongue of a cat infected with feline calicivirus.



2. Oral ulcers may sometimes be harder to detect but they may still make feeding painful and difficult in affected animals.



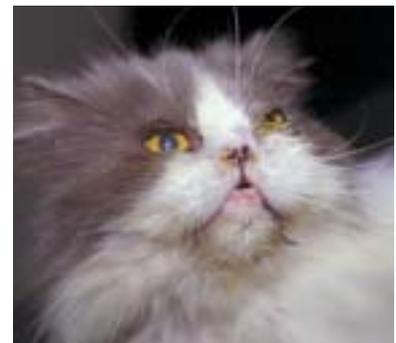
3. Sore eyes (conjunctivitis) and crusting around the nose in a kitten infected with feline calicivirus.



4. This cat is showing signs of severe cat 'flu with marked nasal discharge. Intensive care including intravenous fluids was needed for treatment.



5. The clear part of the eye (cornea) has also become infected in this kitten with herpesvirus infection to cause keratoconjunctivitis. This can lead to ulcers on the eye surface which may prove very painful and result in loss of vision. Such a problem may be difficult to treat successfully and recurrences throughout life may be seen in some individual cats.



6. This cat has a *Bordetella bronchiseptica* infection and is showing many of the signs typically associated with cat 'flu. In any outbreak of respiratory disease, it is often difficult to differentiate which of the infectious causes is responsible, without further testing.



7. A few cats infected with long-term feline calicivirus develop severe inflammation which may affect the back of the mouth (faucitis) as seen here. Sometimes the gums are also affected (gingivo-stomatitis). This painful problem may lead to anorexia and often proves very difficult to successfully treat.



8. Chest X-ray of a cat with pneumonia caused by a Bordetella infection.



9. This kitten infected with feline calicivirus presents non-typically with severe joint pain and a high fever. Such affected individuals sometimes have oral ulcers but may show no respiratory signs. Fortunately the resulting shifting lameness normally lasts only a few days in affected individuals.



10. Occasionally, conjunctivitis may be caused by *Chlamydomphila felis* (formerly known as *Chlamydia felis*). These cases are generally responsive to antibiotic treatment. Nasal discharge and sneezing are not major features of this infection, so unless only the eyes are affected, this problem is not usually confused with cat 'flu.

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## The many faces of cat 'flu:

### Signs that may be seen in cat 'flu due to any cause:-

Fever, lethargy  
Poor appetite  
Swollen / red / runny eyes  
Sneezing and runny nose  
Mouth breathing

### Additional signs that may indicate a particular infectious agent:-

Mouth ulcers (calicivirus)  
Lameness (calicivirus)  
Severe conjunctivitis (herpesvirus, *Chlamydomphila felis*)  
Eye ulcers/corneal disease (herpesvirus)  
Coughing (more unusual with viral cause, sometimes  
seen with Bordetella)  
Fading kittens/deaths in young kittens  
(especially Bordetella & herpesvirus)

#### References:

S H Binns, S Dawson, A J Speakman, L E Cuevas, C A Hart, C J Gaskell, K L Morgan, R M Gaskell (2000) *Journal of Feline Medicine and Surgery* 2, 123-133

A study of feline upper respiratory tract disease with reference to prevalence and risk factors for infection with feline calicivirus and feline herpesvirus

S H Binns, S Dawson, A J Speakman, L E Cuevas, C J Gaskell, C A Hart, K L Morgan, R M Gaskell (1999) *Veterinary Record* 144, 575-580 "Prevalence and risk factors for feline *Bordetella bronchiseptica* infection"



For further information about the Nobivac® range of cat vaccines, please contact your Veterinary Surgeon  
or call the Intervet Veterinary Support Group on 01908 685685, or visit [www.intervet.co.uk](http://www.intervet.co.uk)  
For more information about Bordetella in cats and Nobivac® Bb vaccine, visit [www.nobivacbb.com](http://www.nobivacbb.com)

Nobivac® Bb for Cats contains live *Bordetella bronchiseptica* strain B-C2. Legal category: POM  
Further information is available from Intervet UK Ltd, Walton Manor, Walton, Milton Keynes MK7 7AJ  
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