

Parasites



Prevention and protection for your cat

Most cats in the UK come into contact with parasites. Whether they have access to the open air or are kept indoors, all cats are at risk from infection.

Don't assume that a cat showing no signs of infection is not harbouring parasites. In many cases, infections only become apparent when the burden of infection is too great for the 'host' (ie the cat) to sustain comfortably. This is no cause for alarm as modern treatments are very effective. However, some are potentially toxic to cats so it is essential to follow product instructions carefully.

Avoid using more than one product at the same time on the cat as this may facilitate adverse/toxic reactions. Some products are potentially toxic to other animals (especially fish) and all products applied to the cat must be allowed to dry before handling the animal. This is especially important with young children.

The use of veterinary products is particularly recommended because they are highly effective and safe. A vet can make a diagnosis about the type of parasite involved and discuss the methods of parasite control including the use of appropriate products.

Parasites are divided into two groups:

- **Ectoparasites** which live outside the body (fleas, lice, ticks and mites).
- **Endoparasites** which live inside the body (commonly known as worms).

External parasites

FLEAS

These are by far the most common skin parasite of the cat. Fleas are not fussy about which species of animal they feed and attempt to live on – cats, dogs, hedgehogs or even humans – it's all the same to them.



How do they form?

Most of the flea's life cycle takes place off the host. Tiny white eggs, about 1mm long, are laid in bedding, carpets and upholstered furniture. The eggs hatch in two to 16 days and larvae emerge which look like strands of cotton up to 5mm long. After a further seven to ten days, they change into cream-coloured, immobile pupae. In unfavourable conditions, eg cold or extreme dryness, they remain in this state for up to six months. However in favourable conditions, eg hot, humid summers, the young flea emerges within ten to 17 days. It remains inactive until a warm-blooded creature passes nearby – springing up to one metre, biting the skin and sucking the animal's blood. The whole life cycle may be completed in three weeks under warm, moist conditions, which would explain flea epidemics arising in hot summers.



Signs of fleas

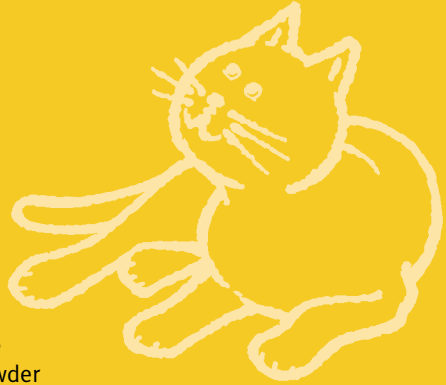
Fleas live on the skin surface and move around at great speed. They may be seen when parting the hair – particularly in light-coloured cats – but this is not always possible. More commonly, the flea's droppings are seen. These are red-brown to black gritty comma-shaped specks, often found in clusters. If these can't be found on the cat, inspect his bedding. A cat with fleas will have flea-dirt and white eggs in abundance. Flea-dirt may be distinguished from particles of dirt and grit by dampening with wet cotton wool. If it is flea dirt it turns red, owing to the presence of blood. Unless cats are allergic to fleabites, they show remarkably little response. There is mild scratching but this often goes unnoticed.

Flea allergies

Unfortunately, many cats are allergic to fleabites and can develop dermatitis (inflamed skin), usually through excessive grooming. This may show up as small lumps felt under the hair of the cat's neck and back. On closer inspection these lumps prove to be crusts of dried serum, which can be easily scraped away with a fingernail. There may be loss of hair on the cat's flanks, rear end, inside hind legs and abdomen. The skin may be raised, thickened and oozing which gives the skin lesion a moist appearance. The skin can become so thickened that it looks like a tumour or nodule and is called an eosinophilic granuloma. The cat is very itchy and scratching causes hairs to break off near the skin. The condition should be treated by a vet but treatment is not effective unless the cat's environment is cleared of both fleas and their eggs.

Treatment

The cat is particularly susceptible to poisoning from insecticides. Therefore it is of the utmost importance to use **ONLY** those products which are safe for cats. Read the label first.



Powders:

It requires two people to powder a cat – one to restrain the cat on newspaper, the other to rub powder into the coat. Once this has been achieved, confine the cat in a mesh carrying-cage in the open air (this minimises the amount of powder the cat inhales) for 30 minutes to one hour. Brush out the powder thoroughly and burn the newspaper afterwards.

The insecticidal powders available from pet shops usually contain pyrethrins and permethrins. They are safe to use but do not provide long-term protection. Use them on cats with an infestation rather than a flea allergy.

Sprays:

The organophosphorus sprays such as *Nuvan Top* (Novartis Animal Health) are highly effective against fleas. They should be applied according to the manufacturer's instructions. People with a history of reactions to organophosphorus compounds should not use these sprays, as there is a risk of exposure.

The fipronil-containing *Frontline® Spray* (Merial) can be applied to cats on a monthly basis. It provides a repellent-active ingredient that kills adult fleas and is safe for cats, including kittens from two days old. The cat's coat needs to be well sprayed for the product to be effective. The spray bottle does not make a hissing sound when being applied. It may also be an effective treatment for ticks, lice, cheyletiella mites and trombiculid larval mites (harvest mites). It is only available from your vet.

Mousses:

Such products contain the insecticide permethrin, eg *Defencat* insecticidal foam for cats (Virbac Ltd), and are applied by gentle stroking of the product over the cat. They should be applied weekly and can be used in kittens from four months of age.

Shampoos:

Shampooing is not generally recommended for the conscious cat! However, if a cat is heavily infested with fleas or lice and the coat is dirty, it may be worth asking the vet to shampoo the cat under sedation. There are no longer any shampoos on the market specifically for cats, but those sold for dogs which contain permethrin or pyrethrum are safe for cats. Always dilute before use and thoroughly rinse off. Shampoos containing other insecticides must not be used on cats.

Impregnated collars:

Flea collars are popular for flea control but should be handled carefully according to the manufacturer's instruction label. They are available from pet shops and supermarkets for cats from six months of age.

If a flea collar is used, the owner must wear disposable plastic gloves while applying it, taking care not to touch either the collar or the surrounding neck region of the cat while it is being worn. The organophosphate is absorbed through the skin of the handler's palms (which are hairless) more easily than through the cat's skin.

Although popular, there are some disadvantages with collars:

- The compounds used on most collars are organophosphates. These are potentially toxic and absorbed through the skin. They should never be used on kittens under six months as they may cause poisoning.
- Collars are effective in killing fleas in the neck region but have limited effect on the rest of the animal.
- No other insecticide should be used while a collar is being worn.
- Some cats develop contact dermatitis in response to flea collars. If this occurs, remove the flea collar, dispose of it safely and seek veterinary advice.
- Owners should be aware that cats going outdoors that readily climb are at risk of getting caught up with their collar and may get stuck.





Spot on agents:

A spot on product is a liquid that is applied externally to an area, which an animal cannot get to, i.e. be able to lick. This is usually at the back of the cat's neck, between the shoulder blades.

There are two spot on flea control products for cats, both are available from vets:

- *Advantage*[™] (Bayer) contains a chemical called imidacloprid. After application it kills adult fleas on contact and the residual activity prevents flea infestation for up to one month. It is extremely safe and may be applied to kittens from eight weeks of age and to pregnant or nursing queens.
- *Frontline*[®] *Spot On* (Merial) is similar to the spray mentioned previously, however, the indications for the spot on product are slightly different than for the spray. The spot on can be applied to kittens from 12 weeks of age and may prevent flea infestation for up to five weeks.
- *Stronghold* (Pfizer) contains selamectin which is similar to ivermectin and is licensed for use on cats from six weeks of age. For flea control apply the product once a month during the flea season.

‘Some flea treatments are potentially toxic to cats so it is essential to follow product instructions carefully.’

Environmental control:

All cats and dogs in the home should be treated with a flea control product. In addition the home environment must also be thoroughly treated. Initially vacuum the whole home as this can remove significant numbers of eggs and larvae. Then treat with an environmental spray. It is important to move the furniture before spraying – flea larvae can crawl up to 50cm and so can also be found underneath beds, tables and other furniture.

There are three kinds of spray commonly used by vets:

- *Vet-Kem*[®] *Acclaim*[®] spray and aerosol (Sanofi Animal Health)
- *Staykill Household Flea Spray* (Novartis)
- *Indorex Spray* (Virbax)

These products contain insect growth regulators including methoprene, cryomazine and pyriproxyfen respectively. These are safe chemicals that stay in the environment to provide a long-lasting chemical that

prevents the fleas from reaching the adult stage of development.

The former two are also available in pet stores as *Canovel Pet Bed and Household Spray* and *Shirleys FLEGO*[®] *Pet Bedding and Household Spray*, respectively.

Essentially, they contain a pyrethrin/permethrin product to kill adult fleas for up to one month and a chemical that inhibits the flea life cycle for up to seven months. These products are an essential part of controlling fleas, especially when cats have access to outdoors where they may come into contact with fleas and bring them home.

Owners may notice that after spraying the home they can still see fleas.



This is due to either the cat bringing in fleas from outside or, most likely, adult fleas emerging from the carpet and bedding areas where the pupa flea stage is protected from vacuuming and house spray. This is called the pupal window and may occur two to eight weeks after treating the house. This event explains why fleas are so difficult to control. It does not mean that the chemicals are not working because of resistance; this has not been documented in the UK.

Program[™] (Novartis) is an alternative to spray products. It contains lufenuron that inhibits flea eggs from developing into larvae. It does not kill adult fleas. *Program* comes in liquid form and is put into the cat's food once a month. This is absorbed into the fat tissue beneath the skin. When the flea bites the cat, it ingests some of the lufenuron and renders its eggs sterile meaning they can't develop.

The drawback with this type of product is that flea-allergic cats are still receiving fleabites, initiating another cycle of pruritus (itching, scratching, licking) and self-trauma. *Program* can, however, be used in pregnant or nursing cats. All dogs and cats in a home should be given *Program* otherwise it is a waste of time treating an individual; if fleas are a major problem, concurrent use of a product to kill adult fleas is important. In some areas *Program* has to be used all year round, in others, it is possible to use it just for the flea season. *Program* is also available as an injection that is effective for six months.

Kittens :

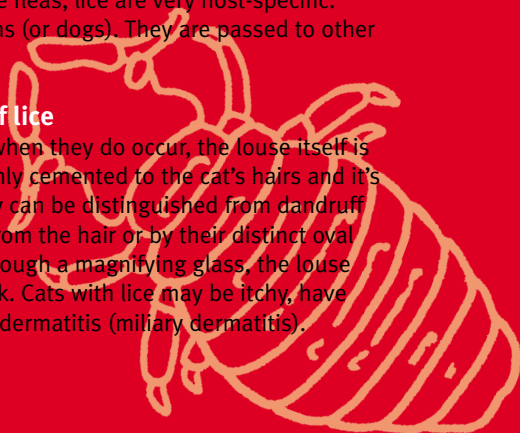
The treatment of kittens presents a particular challenge because they may be profoundly anaemic from multiple fleabites. It is essential to clean up their bedding area and wash any bed materials. If the kittens are still nursing, mum can be treated with a spot-on product (*Advantage*) or a shampoo. A flea comb can also be used to remove adult fleas from the mother and kittens. The kittens could be treated from two weeks of age with a powder (*Head to Tail* veterinary flea powder, Schering-Plough Animal Health) or with *Frontline* spray (Merial) from two days old.

LICE

Infestation is uncommon and may be associated with debility or neglect following a period of abandonment. Unlike fleas, lice are very host-specific. Lice found on cats do *not* breed on humans (or dogs). They are passed to other cats by direct contact.

Signs of lice

Lice are far less common than fleas and, when they do occur, the louse itself is readily seen. The translucent eggs are firmly cemented to the cat's hairs and it's these that are generally noticed first. They can be distinguished from dandruff by the fact that they cannot be removed from the hair or by their distinct oval shape (dandruff scales vary in shape). Through a magnifying glass, the louse appears as a light grey, slow-moving speck. Cats with lice may be itchy, have broken hairs, hair loss, or papulocrusting dermatitis (miliary dermatitis).



Treatment

Some flea control products may be used for treating lice. The major difference in lice control compared with fleas is that eggs remain on the animal and are not killed by insecticides. Therefore, treatment must be repeated at least three times at seven day intervals in order to kill the young lice as they hatch.

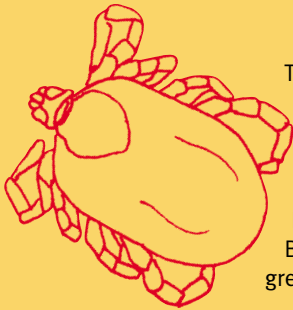
Frontline spray is active for two months on the cat's coat and therefore it kills the young lice as they hatch out. One application should be sufficient. However, remember that the cat is infectious for several weeks. It is advisable to remove and burn the cat's bedding and spray his bed on each occasion, but there is no need to spray the whole house as there is with a flea infestation.

The nits (eggs) remain glued to the hairs even after the young louse has emerged, therefore the presence of nits after several treatments does not mean that lice are still present. It may be possible to clip off heavily infected hairs from a co-operative cat and these hairs should be burnt.

For feral or other difficult-to-handle cats an alternative treatment is an injection or oral dose of ivermectin *Ivomec* (Merial) by a vet. This is not licensed for use in cats (although it has been widely and safely used) so it should be reserved for animals that cannot be treated by licensed products.

TICKS

It is uncommon for cats to be infected with ticks. The culprits are usually *Ixodes ricinus* (the castor bean tick) or *I.hexagonus* (the hedgehog tick). Occasionally *I.canisuga* (fox related) may be found. Cats generally seem unperturbed by ticks but, because ticks are capable of transmitting disease, they should be dealt with.



Signs of ticks

Ticks have a complicated life cycle, most of which is spent on the ground in rough pasture. When a warm-blooded animal passes by, the tick jumps aboard, climbs up the legs and attaches itself firmly to the body by its biting mouthparts. The unfed larval tick is the size of a pinhead and has eight legs. It remains on the host for about five days, gorging on the blood. By the end of this time it may be half an inch in length and a greyish-blue or brownish-black colour.

Treatment

Ticks can be removed with tweezers or killed by applying any of the insecticides safe for cats. Topical treatment with a flea spray before removing the tick is recommended.

It is important to remove the mouthparts that are embedded in the cat's skin. Apply the tweezers underneath the tick's swollen body and grip the tick firmly as close as possible to the cat's skin. Remove with a firm pull and clean the area with an antiseptic solution. The tick will usually release after spraying/dusting or can be allowed to feed and release of its own accord over a five-day period.

Coating a tick with Vaseline is a useful hint especially when dealing with ticks around the face. It blocks the breathing pores and the tick drops off after a day or two. Surgical spirit or methylated spirit is also recommended – apply this to the tick to aid release of the mouthparts. **Never use a cigarette to burn off a tick – this is extremely dangerous.**



MITES

Mites are minute, round or oval parasites with eight legs. They are just visible to the naked eye but more easily seen with a magnifying glass. They cause a range of skin conditions and are generally highly contagious – passing from cat to cat by direct contact or via infected bedding or grooming utensils.

EAR MITES

The commonest mite found in the cat is the ear mite (*Otodectes cynotis*), a tiny mite which lives deep down inside the ear. It causes intense irritation to the skin of the ear canal, causing it to secrete excessive quantities of dark brown or black wax. Cats suffering from this condition may appear unconcerned if the number of mites is few, or they may constantly shake their heads and scratch at the affected area. The brown wax is easily seen on inspection of the inside of the ear. If the cat is scratching its ears but no dark brown wax is obvious, then he probably doesn't have ear mites and so should be examined by a vet.

Treatment

There are several products on the market that kill ear mites in the ear canal. These are readily available from vets. They include:

- *Auroto*[™] (Arnolds Veterinary Products)
- *GAC Ear Drops*[™] (Arnolds Veterinary Products)
- *Canaural*[™] (Leo Laboratories Ltd)
- *Oterna*[™] Ear Drops (Schering-Plough Animal Health)
- *Panalog*[™] Ointment (Novartis).

If the infestation is heavy, use a proprietary ear cleaner to loosen and soften the wax first, eg *Leo Cat Ear Cleaner* (Leo Laboratories Ltd) obtainable from vets. The loose wax can be wiped gently away using cotton wool. Never probe deeply into the ear with cotton wool buds. After cleaning (omit this step if the build-up of wax is only slight), a few mite-killing drops are inserted as deeply as possible into the ear canal and the base of the ear massaged to prevent the cat shaking them straight out again.

You may need to continue the treatment over several weeks – the mite life cycle includes eggs that hatch releasing a new generation of mites to treat, protected from parasitocidal products by the excess ear wax.

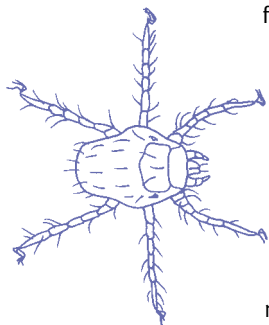
If the ear mites have been treated successfully you'll see an immediate change in your cat – no head shaking or scratching, a reduction in the amount of wax and no mites seen in the ear canal upon inspection by a vet.

If you do not see any change it could be that the drops are not penetrating deeply enough into the ear. Consult your vet for advice.

Ivermectin:

The use of ivermectin, *Ivomec*, (Merial) in dogs and cats is unlicensed. However, cats have been treated with a drop of ivermectin directly into the ear or by injection for recalcitrant cases of ear mite infestation. This is a potentially useful procedure for feral cats. Care should be exercised in using this product in cats less than six months of age. Adverse reactions to ivermectin have followed oral/injection use and include neurological signs. The treatment for *Otodectes* mites is usually repeated at a two to three week interval.

Stronghold (Pfizer) contains selamectin which is similar to ivermectin and is licensed (only available from vets) for use on cats from six weeks of age. The product is applied to the skin on one occasion.



HARVEST MITES

Harvest mites are free-living, red, orange or yellow mites. Cats may become infested when travelling through vegetation in the late summer. Most commonly infected are the ears and feet, but they may be found elsewhere on the body. The mites may be removed with tweezers or treated with a flea powder or spray. They are a self-limiting problem as they drop off after a few days. However, a cat may become re-infested and an application of a flea powder or spray will deter newcomers. Regular topical flea product application can be important in some cats because they are very itchy with such parasitic larvae.

MANGE MITES

The mange mites *Cheyletiella*, *Demodex* and *Notoedres*, a burrowing mite, are very uncommon in the cat. They can only be diagnosed by microscopic examination of skin scrapings. The treatment of such mites is outside the scope of this leaflet and requires consultation with a vet.

MAGGOTS

Occasionally, cats become infected by maggots – blow-flies lay eggs in an open wound or an area of the coat covered in a bodily discharge. The eggs hatch after 24 to 48 hours into larvae, growing rapidly into large maggots that invade the surrounding skin, causing ulceration.

It is not normal for healthy cats to be affected by maggots and these are usually found only in extremely weak animals and should be treated by a vet. However, as a first aid measure, the affected part can be clipped and cleaned with an antiseptic or soap solution. The larvae should then be manually removed with tweezers or flushed out under pressure. Put the larvae in a suitable container (eg a glass jar containing alcohol) and burn them or spray with an insecticide. Insecticide sprays or powders should NOT be put on open wounds, but areas of healthy skin can be treated.



Internal parasites



The two groups most commonly found are the *Cestodes* (tapeworms) and the *Ascarids* (roundworms). There is no immunity to such worms in cats therefore re-infection is possible.

TAPEWORMS

Tapeworms are flat ('tape-like') worms that are common in the bowel of most mammals; the cat included. They consist of a scolex (or head) which attaches itself to the wall of the gut by either suckers or hooks, and a series of segments containing eggs. These segments break off and are passed out of the lower end of the bowel with the faeces. In the external environment they disintegrate, releasing eggs.

Eggs are not directly infectious to other cats since they must pass through an intermediate host in order to complete their development. This host varies for different tapeworms. They live by absorbing pre-digested food in the bowel of the cat but they are not directly harmful. It is a fallacy that tapeworms make otherwise healthy, well-fed cats unable to thrive but, in very heavy infestations, (eg in feral cats) they can cause obstruction of the gut.

Life cycle of *Dipylidium caninum*

Dipylidium caninum is by far the commonest tapeworm in cats and dogs in the UK. It consists of a scolex that attaches itself to the cat's intestine by hooks and a large number of segments. Mature segments contain packets of eggs and these break off the end of the tapeworm and are passed in the faeces. When just passed, the segments are mobile and wriggle around disconcertingly. However, they soon dry up and are recognised by their semi-lucent, 'rice grain' appearance in the faeces or clinging to the cat's fur at its rear end.

For the tapeworm eggs to develop they must be eaten by flea or lice larvae, otherwise they will eventually die. Once inside the flea or louse larva, the tapeworm forms a cystic stage that persists when it becomes an adult flea or louse. If a cat eats the infected flea or louse during grooming, the scolex emerges from the cyst, attaches itself to the intestinal wall and begins to form segments; a new tapeworm is formed. In three weeks, it has matured and egg-filled segments are shed.

Life cycle of *Taenia taeniaeformis*

This tapeworm has more opaque and rectangular segments than *Dipylidium caninum*. For the life cycle to be completed, rodents – especially mice and rats – which act as intermediate hosts, must eat the eggs. This occurs when the cat defecates in the soil, passing mature segments of the tapeworm in the faeces, in an area frequented by rodents. The tapeworm eggs hatch in the rodent's stomach and migrate to its liver, where they form pea-sized cysts. The cat is infected if it eats the rodent's liver. Only cats that hunt and eat their prey will be infected with this tapeworm. It is therefore much less common in domestic cats than *Dipylidium caninum*.

ROUNDWORMS

The fully-grown adult roundworm is similar in appearance to the common earthworm, though white and built on a smaller scale. It grows up to 10cms in length and 5mm in width, but young ones are much smaller.

The commonest roundworm found in the cat is *Toxocara cati*. This is shown to infect on average 28 per cent of cats, and 50 per cent in ferals and kittens under six months. Another roundworm, *Toxocaris leonina*, is much less common, infecting up to 5.5 per cent of cats.

Life cycle

Adult worms live in the cat's intestine and feed on digested food. Their eggs are passed in the faeces (the entire worm is not normally passed). The eggs are not infectious to other cats when first passed, but as they develop into a larval stage after a few days. They may remain infectious for years.

In free-living cats, the faeces (and therefore the roundworm eggs) are deposited in the soil. In indoor cats, they end up wherever the litter tray is emptied. Provided the litter tray is emptied and cleaned daily, there is no risk of infection to humans and other cats from the fresh faeces. (Humans may occasionally catch 'larval migrants' from *Toxocara cati*, although this is usually caused by the dog roundworm, *Toxocara canis*).

The eggs have a sticky surface and may stick to a cat's paws while walking or digging in the soil. They hatch in the stomach and the resultant larvae migrate through the liver and lungs to the trachea where they are coughed up and swallowed. When they reach the gut again, they undergo a final moult and the adult worm begins to lay eggs.

A rodent, bird or mollusc can transmit *Toxocara cati*. They swallow the eggs and cysts are formed within the tissues, commonly the liver. If a cat eats the rodent, bird or mollusc, the cysts are digested and the larvae emerge.

Kittens can be infected with the eggs through the mother's milk. Worming should be started as early as possible.

TREATMENT FOR WORMS

Roundworms:

- Fenbendazole is available as paste, granules or a liquid (*Panacur, Hoescht Roussel Vet Ltd*) and should be administered on three consecutive days for effective roundworm control in kittens. Dosing is recommended at two, five and eight weeks and then monthly from three to six months. Kittens can have adult worms passing eggs from six weeks of age. A single dose every three to six months would be sufficient for adult cats.
- Piperazine is a compound readily available from pet shops and vets, usually as a tablet and is active against the adult worm stage. It is important to



remember to read the package label and weigh the kitten/cat carefully because the wrong (too high) dose may lead to adverse effects including neurological problems.

Tapeworms:

Vets provide the only effective treatments for tapeworms in cats. They cannot be bought over the counter. It should also be noted that vets will supply sufficient for just one treatment at a time whereas products on sale in pet shops are marketed in packs. Hence it is usually cheaper, as well as more effective, to buy worming products from a vet.

- Dichlorphen is widely sold in pet shops and pharmacists under a variety of brand names. It is an outdated drug with very limited effect; the scolex of *Taenia* species of tapeworms may be left intact to grow again and no information is available on its effectiveness against *Dipylidium*. It is not recommended.

- Praziquantel is highly effective against all kinds of tapeworms. Available as a tablet or an injection, the taste of the former can be unpleasant for some cats but it can be crushed and given with food.

Cats that are impossible to pill can be injected.

‘A cat suffering with ear mites may constantly shake his head and scratch at the affected area.’

Photo: Gregory by Georgina Maddox



Combination therapy:

- Fenbendazole: effective in killing *Taenia* tapeworms and roundworms but not the flea-related *Dipylidium*.
- Mebendazole: a compound from the same group, produced as 100mg tablets or one tablet for a 4kg cat twice a day for five days. This product is really so inconvenient to use that it is not often seen on sale.
- Praziquantel plus pyrantel (*Drontal Cat*): currently the most effective all-round wormer for kittens from six weeks of age and for adult cats. Available as a tablet, it is active against *Taenia*, *Dipylidium* and roundworms.

Kittens or adult cats with *Dipylidium* should also be treated for fleas as discussed earlier in this leaflet. Equally cats with fleas or lice should be considered candidates for worming for tapeworms.

Summary:

Kittens – treat for roundworms as above, with tapeworm therapy if fleas are implicated.

Adult cats – they can have roundworms, and tapeworms if they either hunt and eat their prey or get flea infestations. They should be wormed with a combination product every three to six months.

Feral cats – are very similar to adult cats and should be treated with a combination of products, with initially two treatments two weeks apart.



*‘The commonest roundworm found in the cat is *Toxocara cati*. This is shown to infect on average 28 per cent of cats, and 50 per cent in ferals and kittens under six months.’*

Photo: Luca by R Letton



We are grateful to Aiden P Foster MRCVS for updating this leaflet.

Although trade names are mentioned, Cats Protection is not able to recommend one product over another.

Donations towards printing and postage are always welcome

Cover photo: Chakotay by Cheryl Hanson