# The Laboratory Cat

**ANZCCART Facts Sheet**

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## Introduction

The laboratory cat (*Felis catus)* is predominantly carnivorous and predatory. Cats are excellent climbers and leapers but are sedentary except when hunting. They have forward placed eyes and ears which give binocular vision and excellent hearing, enabling them to use sight and sound for hunting. Smell is not as well developed as in the dog. They have colour vision, a useful adaptation for their predatory life style.

Cats are generally solitary by nature, with strong territorial ties. At most they may form loose knit social groups. Despite this lack of social hierarchy, cats can be housed together, provided they are given sufficient space to escape the unwanted attention of other colony inhabitants.

Cats have some physiological features more in common with humans than the laboratory rabbit or rodent, hence they have been extensively used in behavioural and biomedical research, particularly in the neurological sciences.

Areas in which they have been used include :

- nerve impulse transmission e.g., reflexes of the respiratory system, and spinal reflexes associated with nociception;
- light perception, sound perception and body reaction to exposure to chemical stimuli;
- neuropharmacology, particularly the testing of psychotropic drugs;
- behavioural studies;
- cardiovascular studies;
- toxicology;
- oncology; and
- chromosomal abnormalities.

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In Australia and New Zealand, the procurement of cats for use in research is generally not controlled to the same extent as dogs, although this varies between the two countries and from state to state within Australia.

The use of cats as research animals is often fraught with more difficulty than many other laboratory species, because their use is emotive, as they are a common companion animal. Any researcher using laboratory cats must source his/her cats from a legal and reputable source and records of such procurements must be maintained.

Researchers should obtain cats from sources which purpose-breed research cats, or from city pounds that permit the use of stray cats for research. In Australia, there are two major commercial sources of cats, one purpose-bred, the other pound-sourced, as well as several smaller suppliers.

There are no commercial suppliers of specific pathogen-free (SPF) cats in Australia, although there are three colonies belonging to research institutes that are maintained as SPF facilities. However, the number of SPF cats produced is only sufficient for the internal use of these institutions.

Since all commercially supplied cats in Australia and New Zealand are conventionally reared and maintained or acquired, researchers can expect up to 20-30% morbidity. The real mortality can be reduced to 5% if the cats have been adequately acclimatised and conditioned before issue to the researcher.

Researchers must ensure the cats they use for research are overtly healthy, short-haired, (for ease of use and hygiene of the cats), young and socialised to human contact.

## Colony husbandry

### *Behaviour*

Cats are generally non-social, but can adapt to group living. In groups they sleep together, groom each other and play. An ideal group is approximately 20 individuals, as this enables a hierarchy to form which tends to be relatively stable, so that aggression between particular individuals is not as frequent as in smaller groups. Mature females form stable and peaceful groups more readily than do sexually mature males.

Young cats play frequently and their social development is facilitated by colony environments that encourage play. Older cats still play, but on a less frequent basis. An adult cat can spend up to 60% of its time sleeping.

Territories are marked by urine spraying and smearing surfaces with the scent glands located on the chin and on the head in front of the ears.The cat has olfactory communication. Both sexes will rub skin scent glands and males (toms) will spray urine on many surfaces as part of territory marking behaviour.

Cats defecate and urinate in defined spaces and in specific litter types (many cats exercising a preference for specific litter textures). In the colony situation this is not necessarily the one spot nor the one litter type for all cats, hence faeces and urine may be deposited in several sites by several sub-sets of the larger group. Many cats will not defecate or urinate in litter trays already soiled by other cats. This makes cats a difficult colony animal, as they tend to soil their enclosure quickly.

Communications between cats often relate to aggression and warnings, so that handlers and researchers will hear vocalisations such as growling, screeching, spitting or snarling. However, the ubiquitous purr cannot be overlooked as a sign of contentment. Facial expression such as ear flattening and teeth displays, together with an arched body posture, also indicate aggression.

***Staffing and handling***

Cats are sensitive to the people that look after them and to their physical surroundings. They can become extremely nervous when confronted with new people or strange surroundings, or the bustle and rush of poor organisation in the animal house. If the researcher must change personnel or surroundings, then sufficient time must be allowed for the cats to adjust before undergoing experimentation. Only calm and gentle staff who are organised and have an empathy for the needs of cats should be selected as animal attendants.

Handling of cats requires confidence and a degree of gentleness in order to avoid startling the animals. Speaking to cats on approach is a good technique. More important is the continued interaction between animal attendants and cats. This must include a period of time during the day where the animals are petted and played with, which is not part of routine cleaning and feeding. This is hard to accept for laboratory animal house managers who often see time as money, but the investment of quality 'interaction' time is rewarded by social animals that are less timid and aggressive to humans. When cats do not respond to gentleness or prove difficult to handle, it is wise to remove them from the colony as soon as possible.

Another common technique used in many animal houses to provide a secure environment is the playing of a radio to provide background music and talk. This avoids their being startled by sudden noises and provides a degree of continuity in their environment.

***Restraint***

To restrain a quiet cat wrap it in a towel or place it in a canvas bag tied around its neck or hold it against the attendant's body, while holding the cat by the scruff of the neck.

'Clipthesia', where spring pegs or spring paper clips are placed along the dorsal mid-line of the cat can be used to render it immobile. This technique is effective in providing restraint in about 50% of adult cats, sufficient to allow blood collection or other minor procedures. It causes no pain, is without stress and allows the cat to return to normal function on removal of the clips. The physiological basis of the restraint is not well understood, but it is a humane way of cat restraint (Tarttelin, personal communication).

The problem with physical restraint is that even the most placid cat can become aggressive and inflict a nasty wound on the attendant. The use of chemical restraint for all but the most minor procedures is therefore recommended.

The most efficient method of chemical restraint is the use of a combination of ketamine hydrochloride and xylazine, ketamine hydrochloride and diazepam, or ketamine hydrochloride and acetylpromazine. Dose rates are given in the section on anaesthesia and analgesia.

***Breeding***

The female cat (or queen) is seasonally polyoestrous, with her season lasting from late winter through to early autumn. There is an anoestrus period of two to three months over winter. However, with a 12 hour light : 12 hour dark or 14 hour light: 10 hour dark cycle, cats can breed year round. Even without artificial lighting, a small percentage of cats will continue to breed in winter.

Queens can be run as a harem mating system, with approximately 20 queens to two males (toms) or can be mated on a one to one basis. The queen should be mated when physically mature at around 12 months of age, or approximately three kg in body weight. In the harem system, the queen will generally mate with the dominant tom, but will exercise a choice in mates. It is therefore advisable to have at least two toms, but never more than three toms in a harem, as greater numbers of toms increase the risk of aggression. A one to one mating requires the animal attendants to detect the oestrous queen. The queen shows no overt, oestrogen- dependent, external anatomical changes during oestrus. The only way to detect oestrus is by the behavioural changes which are oestrogen-dependent, and by vaginal smear, with oestrus determined by vaginal cell cornification.

The behavioural change of oestrus most obvious in the cattery situation is calling in a frequent low pitch miaow. Stimulation along the back by stroking with the finger of the attendant will often lead to the queen adopting a crouching position, lifting the pelvis, holding the tail to one side and possibly treading with the hind feet.

Oestrous behaviour will last four to six days, but if mating has not occurred it can exceed eight days. The queen is an induced ovulator, with metoestrus lasting 10 to 15 days. The cycle is without a luteal phase.

When coitus occurs, a luteinising hormone peak follows, which will induce ovulation approximately 12 to 24 hours later. Generally, a queen requires more than one mating to induce ovulation. Litters of kittens can therefore be sired by two or more toms.

The embryos implant 12 to 14 days after conception, with gestation lasting 59 to 65 days. Pregnancy can be detected at four to six weeks by palpation, by ultrasound or by X-rays.

If the queen has a sterile mating or an artificially induced ovulation (through stimulation of the vagina and cervix with a sterile cotton pledget or glass rod), a luteal phase is induced, which lasts approximately 42 days. This is frequently called a pseudo, or false, pregnancy.

In the one to one mating program the oestrous queen should be taken to the tom's territory for mating to occur. Queens should not be allowed to have their litters in the

harem and, where possible, they should be housed individually to reduce the likelihood of mismothering. If a queen litters in a harem, the kittens can be stolen by other near-term queens or attacked and killed by the breeding tom.

In one to one mating systems the queen's due date can be calculated by the animal attendant. However, in the harem mating system, mating dates are generally not recorded and the animal attendant must detect heavily pregnant queens in the colony and remove them to appropriate litter cages. When the queen is removed depends on the physical signs of pregnancy and the abilities and experiences of the animal attendant. Some of the technical literature on cat breeding recommends that the queen spends a few hours per day with the harem during her confinement and subsequent lactation, in order to avoid a major disruption to the established colony hierarchy and to minimise aggression on her reintroduction once her litter has been weaned.

Kittens are born with hair but are blind and deaf, with development of these senses over the next 10 to 14 days. The milk of the queen is rich in fat and low in lactose, enabling the kittens to gain 80 -100 gm per day. Kittens are generally weaned at six to eight weeks and kept in peer groups until maturity (six months). Vaccinations and other veterinary treatments are performed as necessary (Allen and Bonning, 1992). (See also disease control measures at the end of this facts sheet).

Generally queens and breeding toms can live for 10 to 13 years, but are productive for six to seven years. A productive queen can produce two litters a year, averaging three to four kittens per litter.

***Kitten development***

Adequate kitten socialisation is essential if the researcher is to have well-adapted, behaviourally normal animals with which to work. This should start from day one of life, with animal attendants having contact with the kittens and the queen. Nervous or asocial mothers may abandon the litter, but these queens should not have been used as breeders in the first instance. Temperament of the litter has been correlated to the temperament of the queen and the sire. Only the most social cats should be selected as breeders.

Cats have a shorter socialisation period than dogs. The critical window is as short as the first two months of life. It appears that cats need continued reinforcement of this socialisation in order to maintain their psychological well-being and their acceptance of human contact. Excessive handling for non-socialised or asocial cats is very stressful, and animal attendants should make every effort to reduce stress on the litters by a calm, gentle and consistent approach to all kittens.

**Housing**

***Caging***

Cats are kept in individual caging or in group pens that provide approximately 0.3 to 0.5 $m^2$ per cat. Sufficient care needs to be exercised to cater for the psychological well-being of the individual cat. This includes the provision of a resting shelf above the floor, a dark box in which to hide and a litter tray that is remote from the resting area, since cats do not like sitting in or being close to their excreta. An interesting visual outlook, especially for mature cats, who are not as likely to play with toys as kittens, is essential. This can be as simple as a window looking out on a busy corridor or courtyard. Nesting material must be hygienic and disposable. Clean rags satisfy these two criteria and are relatively cheap.

In the group situation, the most essential criteria for acceptable housing are the provision of an adequate number of hides and escapes for cats. This enables individuals to stake out mini-territories or to retreat to a safe haven in the face of aggression from another group member. The other aspects of the group housing environment include good use of the vertical space by providing walkways (static and swinging), hammocks and climbing frames at various heights and the provision of an interesting visual outlook. There is no reason why group cat pens should not look out over staff work areas, staff walkways and other areas of high activity.

Cats held in enclosed rooms generally require the same conditions that are suitable for a range of laboratory animals. These are:

| | |
|---|---|
| temperature | 20 to 22 °C |
| air changes | 15 per hour |
| humidity | 65% |
| lighting | 150 lux |

Feline respiratory diseases are one of the greatest problems for a research cattery and hence good ventilation and humidity control are essential to minimise the consequences of these diseases. Cats can tolerate temperature extremes at both ends of the scale, as low as 15°C and up to 30°C for prolonged periods, but they cannot tolerate draughts of about 20 cm/sec. This stresses them, predisposing them to respiratory diseases.

Hygiene is essential in the cattery. Faecal contamination is not confined to the litter trays provided and as the level of excreta builds up cats tend to find proximity to it unacceptable. Also unacceptable to cats is stale and used food. Cats should be fed sufficient to eat in a 20 - 30 minute period and the remainder removed. Several small feeds should be supplied throughout the day, rather than one large one which increases wastage by having food left over. All equipment and caging used for cats must be able to stand vigorous cleaning. During cleaning times, cats must be able to escape the accompanying water, noise and disruption.

Pens can be totally enclosed, (which has the advantage of providing a constant environment and some sort of barrier to disease), but this incurs a higher building cost. Cats can be kept in an outdoor pen with or without enclosed sleeping quarters. Outdoor pens expose cats to seasonal fluctuations with resultant variable breeding cycles. They are also harder to maintain as a minimal disease cattery, because of the increased risk of exposure to feral cats. Despite these risks, most catteries are maintained as open enclosures, because building costs are less and minimal disease cats have not been a high priority for researchers.

***Psychological well-being***

Three general environmental conditions need to be met to fulfil the psychological needs of cats. These are complexity of the environment, a degree of unpredictability within the environment and an opportunity to exercise a degree of control or choice over the environment (Holmes, 1993).

Some commercial catteries provide their cat groups with plantings of catnip (*Nepeta cataria*). Approximately 50%

of cats display behavioural responses to the presence of the active ingredient of catnip, nepetalactone. This product is biochemically related to the narcotic agent in marijuana and in cats acts solely via the olfactory system.

***Transport***

Transport boxes should be IATA-approved. They are generally 65 cm long, 40 cm wide, 40cm high and contain absorbent bedding. To minimise the stress of transport, the boxes should be placed in the pen 24 hours before the animals are put in them. This enables the cats to scent-mark the box, to explore it and become familiar with it.

The use of anxiolytic drugs to transport cats is the subject of debate and it is suggested that use of such drugs is unnecessary and possibly contraindicated. This is conditional on the receiving laboratory providing adequate refuges and security for the newly arrived cat. The receiving laboratory should place the cat in its new enclosure with its transport box open. The cat can leave the box (which is familiar territory) in its own time and explore as it desires. The enclosure should be quiet, with refuges and shelves located around the walls. The cat should not be handled by strangers until it has first become accustomed to its new environment. In this way the cat has exercised some control over its exposure to the new environment. The use of anxiolytic drugs only delays adaption to a new environment and in fact dulls the normally acute senses of the cat.

**Nutrition**

Cats cannot survive on diets adequate for other carnivores such as dogs. They are obligate carnivores and require between 15 and 30% dietary protein having a high biological value. Cats require taurine as an additional amino acid to the ten amino acids generally recognised as essential for mammalian life. Dogs can synthesise taurine from methionine and cysteine but cats do not have sufficient enzyme activity to complete this pathway. Instead, cats convert cysteine into felinine or glutathione. Without taurine, cats develop a degenerative retinopathy (Tarttelin, 1991).

Other interesting aspects of cat nutrition include:

- inability to utilise beta-carotene as a source of vitamin A;
- inability to use tryptophane as a source of vitamin $B_3$ (niacin);
- inability to produce arachidonic acid (an essential fatty acid) from an excess of either of the other two essential fatty acids (linoleic or linolenic acid);
- a need for iodine at far greater levels than other carnivores (such as the dog);
- intolerance to high magnesium levels; and
- dependence on vitamin B, as are all mammals; however, fish-only diets or heat-sterilised commercial diets can result in a deficiency state, leading to a neuropathy known as Chastek Paralysis (Allen and Bonning, 1992).

***Feeding strategies***

Palatability is dependent on quality protein, fresh (non-rancid) fat and food texture. The cat prefers a variety of food and will eat a range of protein sources.

A variety in diet needs to be introduced to the kitten in its socialisation stage of development, because dietary fixation can occur after weaning, especially if a single highly palatable food source is supplied. The diet should be fed at room temperature, as cats generally do not like chilled food. Rancid fat not only reduces palatability, but is known to oxidise vitamin E, which can result in hypovitaminosis and subsequently steatitis. All meat and protein products must be fresh and kept refrigerated until just before feeding. To improve the nutritional balance of the cat colony and to provide for the psychological well-being of the cats within the colony, it is acceptable to provide culled rodents. This enables cats to play, predate and consume a natural diet. Cats should not be fed raw mutton or poultry to avoid the risks of transmitting toxoplasmosis.

**Anaesthetics and analgesics**

***Anaesthetics***

As the veterinary literature has much information on anaesthesia in cats, it is not necessary to describe these methods in great detail here (Hall and Clarke, 1991). Cats can be difficult to restrain if they are asocial or aggressive. Intramuscular or subcutaneous anaesthetics are the method of choice in this situation.

***Injectable anaesthetics***

Ketamine hydrochloride has been the main agent for use in these situations, but on its own it is not a true anaesthetic agent and does not provide analgesia for visceral pain. It is classified as a dissociative anaesthetic and induces a cataleptic sedation in cats, with a variable degree of analgesia and a characteristic increase in muscle tone. The dose is generally 20 mg/kg intramuscularly (i/m). Due to low pH, the use of ketamine subcutaneously (s/c) invariably causes a marked pain response.

Ketamine is often used in combination with either diazepam (Valium™) or xylazine (Rompun™). Diazepam potentiates the action of most anaesthetic agents while providing good muscle relaxation. The i/m dose rate of the ketamine hydrochloride /diazepam combination is 10 mg/kg:1 mg/kg respectively.

Xylazine is an alpha-2-adrenergic agonist tranquilliser, is a good sedative and potentiates the action of most anaesthetics. It also has some analgesic properties, but these tend to be short-lived and post-surgical pain relief is necessary. The i/m dose rate of ketamine hydrochloride: xylazine combination is 10 mg/kg:1 mg/kg respectively.

Acepromazine is a phenothiazine derivative commonly used in veterinary medicine, which also potentiates the action of most anaesthetics. It has a long-acting sedative effect which makes recovery from anaesthesia quite smooth. The i/m dose rate of ketamine hydrochloride: acepromazine combination is 20 mg/kg:0.1 mg/kg respectively.

The other injectable anaesthetics commonly used in cats include alphaxalone/alphadolone (Saffan™), disopropylphenol (propofol) and barbiturates (both thiopentone for short-acting anaesthesia and pentobarbitone for long-acting anaesthesia).

Intravenous (i/v) dose rates are:

- alphaxalone/alphadolone (Saffan™) 9-12 mg/12-18 mg/kg
- diisopropylphenol (propofol) 7.5-15 mg/kg
- thiopentone 10-15 mg/kg
- pentobarbitone 25 mg/kg

A new combination anaesthetic product is zolazepam/ tiletamine in equal proportions (Zolatil™). It is given i/v or i/m at 15 mg/kg and provides deep sedation/light anaesthesia which can last up to six hours.

The advantages and disadvantages of the injectable anaesthetics are extensively detailed in the veterinary literature and must be consulted before any procedure requiring anaesthesia is performed (Hall and Clarke, 1991 and Flecknell, 1987).

***Inhalation anaesthetics***

Inhalation anaesthesia is the preferred method of anaesthesia in cats and the chemical agents used are ether, halothane and isoflurane.

The use of ether is not supported by most researchers due to its irritant nature and its high flammability, although it has a good safety margin. The use of ether in cats would require strong justification before it could be approved by an institutional animal ethics committee.

Halothane is the most commonly used volatile agent. It is cheap and effective, but is not without some degree of risk. It is known to be hepatotoxic and may be mutagenic. Good scavenging systems must be in place to remove the excess halothane during anaesthesia and surgery.

Isoflurane is a more recently available agent. Very little is metabolised during anaesthesia and it appears to be safer to theatre staff than halothane. It is more expensive than halothane.

All surgical anaesthetics should be performed with the cat intubated with an endotracheal tube. Intubation is relatively straight-forward, as the larynx is readily visualised. However, cats may respond to laryngeal stimulation by going into laryngospasm. This can be overcome by spraying the larynx with 2% lignocaine solution or placing xylocaine jelly on the end of the endotracheal tube.

***Analgesics***

Cats have long been considered unsuitable for analgesia, because of their extreme sensitivity to opioids and their inability to detoxify paracetamol, a potent non-steroidal anti-flammatory drug (NSAID) used in human medicine. Cats also have a low safety margin for other NSAIDs, such as phenylbutazone and aspirin.

However, this is an incorrect assumption and if opioids are used in pre-operative and post-operative strategies, depth of anaesthesia can be lessened and recovery and healing hastened.

Pethidine at doses of 3-5 mg/kg s/c or i/m given pre-operatively and buprenorphine given at 0.005 to 0.01 mg/kg s/c or i/m post-operatively is recommended. For longer-term analgesia, aspirin is a suitable NSAID provided a dose rate of 10 mg/kg is given orally every 24 to 48 hours for two to four days maximum.

As cats do not have the hepatic enzymes to rapidly detoxify aspirin, prolonged use can result in aplastic anaemia and thrombocytopaenia.

**Technical procedures**

***Specimen collection***

The two most common biological fluids collected from cats are blood and urine. Blood is usually collected from the jugular vein or the cephalic vein of the foreleg. Surgical cannulation of the jugular is possible for frequent sampling. For less frequent samplings that do not require cannulation of the jugular vein but do require a high degree of co-operation, chemical restraint should be considered. To improve visibility and access to the veins the hair over the vessels should be clipped and the skin swabbed with 70% alcohol.

Urine can be collected by sterile cannulation of the bladder, which requires the cat to be chemically restrained. Other methods include urine voiding by gentle pressure on the full bladder or direct sampling by abdomenocentesis, through an aseptically prepared site along the caudal midline of the abdomen. These do not necessarily require chemical restraint, as they are not overly painful or stressful, but if the cat is likely to object, chemical restraint is the preferred method of control.

***Identification of cats***

Many cats have unique pelt marking and can therefore be identified by the use of outline drawings. Tattoos of numbers on the inside of the ears, a collar and identification tag, or an electronic chip implanted s/c are other methods used.

***Euthanasia***

The most common method of euthanasia is an intravenous barbiturate overdose. For the quiet cat this is a simple, stress-free and effective method. For the asocial or aggressive cat the i/v method is not easily or safely performed. In this case, it is best to heavily sedate the cat with ketamine hydrochloride: xylazine. This can be given i/m using a crush cage or through the wall of a thick canvas restraining bag. Once the cat is adequately sedated a barbiturate overdose can be given either via the jugular or cephalic vein or by an intracardiac injection.

***Diseases***

References to the veterinary literature are given at the end of this facts sheet. Only a brief summary of diseases is provided here. Diseases which are important can be categorised as:

- respiratory;
- haemo-lymphatic;
- dermatological;
- urological;
- gastro-intestinal; and
- zoonotic.

These are listed in tables 1 to 6. Veterinary advice should always be sought.

***Haematology, biochemistry and physiology***

The readily available veterinary literature and texts make the search for common physiological data easy for the researcher and does not require extensive description in this paper.
For haematological data the reader is referred to Janin, (1986).
For biochemical data the reader is referred to Kaneko, (1989).
For physiological data the reader is referred to Ringler and Peter, (1984).

**Table 1** **Respiratory diseases of cats**

| Disease | Signs | Treatment | Control |
|---|---|---|---|
| Feline viral rhinotracheitis | fever, sneezing conjunctivitis | Nil, treat secondary invaders. | Vaccinate. Lifetime carrier status in recovered cats. |
| Feline calicivirus | sneezing, conjunctivitis | Nil, treat secondary invaders | Vaccinate. No carrier status but long-term shedding after recovery. |
| Chlamydiosis | sneezing, conjunctivitis | tetracyclines, doxycycline | Carrier status in recovered cats. |

**Table 2** **Haemo-lymphatic diseases of cats**

| Disease | Signs | Treatment | Control |
|---|---|---|---|
| Feline panleucopaenia | Fever, diarrhoea, dehydration, fall in white blood cells. | Nil. Treat secondary invaders and provide fluids. | Vaccinate. |
| Feline immuno-deficiency virus | None obvious. (Clinically apparent due to immuno-deficiency and subsequent secondary infections. | Nil. When clinically apparent, euthanasia recommended. | ELISA test all older cats showing chronic ill-health. |
| Feline infectious peritonitis | Abdominal distension due to ascites (effusive form) or granulomatous peritonitis (dry form). | Nil. Euthanasia recommended | Control immuno-suppressive diseases such as feline leukaemia virus (FeLV). |
| Feline infectious anaemia | Anaemia, jaundice. | Tetracycline, doxycycline. | Life-long carrier after recovery. Control immuno-suppressive diseases such as FeLV. |
| Feline leukaemia virus | Most common presenting sign is lymphoid or myeloid neoplasia or aplastic or hypoblastic anaemia. Rarely immunodeficiency. | Nil. When clinically apparent euthanasia recommended. | New vaccine available. Use may be justified in multiple cat environments. ELISA test for chronic viraemic cats. |

**Table 3** **Urological diseases of cats**

| Disease | Signs | Treatment | Control |
|---|---|---|---|
| Feline urological syndrome | Dysuria, haematuria, staining | Bladder catheterization urinary acidification, antibiotics | Ensure urine pH below 6 and dietary phosphate levels and magnesium levels are low. |

**Table 4** **Gastrointestinal diseases of cats**

| Disease | Signs | Treatment | Control |
|---|---|---|---|
| Coccidiosis | Bloody diarrhoea, oocytes in faeces, dehydration. | Sulphadimidine | Reduce stress, improve hygiene. Immunity after infection is not strong. |
| Campylobacteriosis | Profuse diarrhoea, dehydration. | Erythromycin, fluid replacement therapy. | Good hygiene essential. Culture of faeces to identify carriers. |
| Salmonellosis | Fever, dehydration, septicaemia, diarrhoea. | Fluid replacement therapy with or without antibiotics. Euthanasia if severe. | Carrier status after recovery maintains risk to cattery. |
| Enteric helminths | Diarrhoea, ill-thrift, anaemia. | Broad-spectrum anthelmintics. | Consult veterinary texts. |

**Table 5** **Dermatological diseases of cats**

| Disease | Signs | Treatment | Control |
|---|---|---|---|
| Dermatophytosis (ringworm) | Circular areas of alopecia on skin. | Griseofulvin (teratogenic in pregnant queens) - skin and coat washes | Recovery within 30 days unless kitten is immuno-suppressed. In this case it can become generalised. |
| Flea infestation | Obvious presence of parasites and parasite debris. | Insecticidal washes and environmental sprays. | Environmental control is essential. Good hygiene is necessary. |

**Table 6** **Zoonotic diseases of cats**

| Disease | Signs (in humans) | Treatment | Control |
|---|---|---|---|
| Campylobacteriosis | Diarrhoea. | Seek medical advice. | Avoid faecal contamination. |
| Salmonellosis | Diarrhoea and septicaemia . | Seek medical advice. | Avoid faecal contamination. |
| Roundworm | Visceral larval migrans. | Seek medical advice. | Avoid faecal contamination. |
| Ringworm | Round areas of urticaria and hyperkeratosis. | Fungacidal ointments and washes. | Wash hands after handling cats and wear gloves. |
| Toxoplasmosis | Congenital abnormalities of human foetuses and abortion | Seek medical advice. | Pregnant women must avoid handling cat faeces and raw meat. |
| Cat scratch fever | Localised or generalised lymphadenopathy. | Nil, but prophylactic broad spectrum antibiotics are sometimes used. | Avoid cat injuries by not taking risks e.g. use of chemical restraint for difficult to handle cats. |

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