

# Neonate Care Manual

Approved November 2019

RSPCA New South Wales

# Contents


1. Aim 3
2. Categories 3
3. Considerations when hand rearing kittens 3
4. Development stages 4
    4.1. Age 0 – 1 week 4
    4.2. Age 1 – 2 weeks 4
    4.3. Age 2 – 3 weeks 4
    4.4. Age 3 – 4 weeks 5
    4.5. Age 4 – 5 weeks 5
    4.6. Age 5 – 6 weeks 5
    4.7. Age 6 – 7 weeks 6
    4.8. Age 7 – 8 weeks 6
5. Feeding 7
    5.1. What should you be feeding? 8
    5.2. Feeding schedule 8
    5.2. How to feed neonate kittens 9
    5.3. Weaning 10
    5.4. Aspiration pneumonia 10
    5.5. Dehydration 11
6. Toileting 11
    6.1. How to stimulate a kitten 12
    6.2. Transition to litter tray 12
7. Living space 12
    7.1. Where to keep kittens 12
    7.2. How to keep kittens warm 12
    7.3. Hypothermia 13
8. Hygiene 14
    8.1. Personal hygiene 14
    8.2. Daily cleaning 14
    8.3. Cleaning the kitten 13
9. Health 15
    9.1. Infectious diseases 15
    9.2. Vaccinations 16
    9.3. Parasites 17
    9.4. Parasite prevention 18
    9.5. Desex 19
    9.6. Diarrhoea 19

Appendix 1 – Neonate Daily Weight and Feeding 20

# 1. Aim

To provide kittens under the age of eight weeks the nurturing attention necessary for them to heal, learn, mature and grow into medically and behaviourally healthy kittens.

- Not only to survive but be thriving kittens and cats
- To be wonderfully social companion pets

# 2. Categories

- 0 – 2 weeks neonate
- 2 – 4 weeks transitional
- 4 – 8 weeks socialisation

# 3. Considerations when hand rearing kittens

A few basic things to consider when hand rearing kittens:

- You need to provide a suitable clean and warm environment and an age-appropriate feeding regimen. You also need to stimulate urination and defecation, ensuring adequate volumes are passed, and maintain hydration and attention to general health needs.
- Kittens can become ill very quickly, which can lead to complications and in the worst case, death. Total dedication to neonate kittens is always required. It can be very emotionally tough when mortality is a real risk.
- The major problems that can be encountered with hand rearing kittens are: hypothermia, dehydration, starvation, hypoglycemia (low blood sugar levels), constipation, kidney or bladder problems (from inadequate stimulation), over heating (burns may also occur), yeast infections (improper hygiene when preparing formula) and general hygiene (very important due to compromised immune systems).

Foster animals should be kept in a safe, secure and in an uninfected area, but not isolated – they should have ample time around humans for socialisation.



# 4. Development stages

## 4.1. Age 0 – 1 week



At birth, kittens will weigh approximately 100 – 110 grams and will sleep 90 per cent of the time. Handling is minimal and will only be necessary during feeding times. Kittens of this age are unable to see or hear due to their ears and eyes being closed, but will have a good sense of smell.

Newborn kittens' rectal temperature will range between 35.0 – 37.2˚C. They are unable to regulate their own body temperature, which means a heating source must be provided to keep them warm, such as an electric heating pad or hot water bottle (this requires regular monitoring and reheating to ensure they are kept at a suitable temperature). You must ensure that the heating device is not in direct contact with the kittens as they do not have the ability to move away. It is important to monitor the temperature inside the kitten's enclosure maintaining it between 29.5 – 32.5˚C. Keep in mind the room's ambient temperature can affect the temperature inside the enclosure. This age group has the highest mortality rate.

## 4.2. Age 1 – 2 weeks



Between 1 – 2 weeks of age, kittens should have gained approximately 100 grams in weight, weighing around 200 grams. Their ear canals and eyes will begin to open – eyes should be fully opened around 10 – 12 days old. They are still unable to regulate their own body temperature and their rectal temperature will increase to between 36.1 – 37.7˚C. At around 7 – 10 days old, you can begin to decrease the enclosure temperature to 27˚C, but it is important to do this gradually as you do not want to shock the kitten's body. Continue to keep handling to a minimum but begin to introduce outside noises, e.g., vacuum, washing machine, dish washer and garage door. It is important to introduce these noises young as it will help guide them during the socialisation period.

## 4.3. Age 2 – 3 weeks



At this stage, kittens should be gaining approximately 10 – 30 grams per day. At around 18 – 21 days old they will become more active by crawling, trying to stand and playing with each other. At this point, you may begin transitioning them into a bigger enclosure, still being mindful of maintaining a temperature of 27˚C. The kittens' eyes and ears should be fully opened by now, allowing them to see and hear all that is going on around them. Keep their enclosure central in the house so they can see and hear more of what happens daily. This is the starting point of critical socialisation. Touch and handling is very important.

## 4.4. Age 3 – 4 weeks



Kittens should be gaining around 70 – 100 grams each week now, weighing approximately 300 – 450 grams. It is okay if they have not reached this weight but are still consistently putting on weight each day. Continue to keep a stable temperature of 22 – 27˚C and check the kitten's temperature as they will be more active, which helps to regulate their temperature. At this point they will be grooming themselves but still may need that extra hand with larger messes as this skill is still developing. It is a good idea to start introducing a litter tray into their enclosure, something that is low and easily accessible for the kittens to get in and out of. Place any messes outside of the litter tray inside so they associate the smells. If they are eating the litter, remove the tray and wait a few more days to introduce again.

## 4.5. Age 4 – 5 weeks



By the end of four weeks, kittens should be able to regulate their own temperature as they are now quite active. Heating sources can still be provided, allowing them to use when needed and avoid when not. Ensure the room's ambient temperature stays around 24˚C. Their sight and hearing will be fully developed, and they will begin to engage more with what is occurring around them. Small intervals of 5 – 10 minutes a few times a day of supervised play outside of their enclosure is encouraged, as they need to begin interacting with more people and objects within the home. The litter tray must be available 24/7 at this point and they should begin to understand and utilise it for its purpose. Kibble and water should also be available 24/7.

## 4.6. Age 5 – 6 weeks



Begin to increase time outside of their enclosure. Still under supervision, start to introduce a variety of toys and textures so they can begin to display 'normal' cat behaviours. Although the critical socialisation period begins at two weeks of age, it is important to continue with human interaction and exposure to household sounds will help develop socialisation skills.

## 4.7. Age 6 – 7 weeks



Kittens will be grooming and washing themselves independently and actively using litter tray. With a large litter, be sure to have multiple trays around after mealtime and naps.

## 4.8. Age 7 – 8 weeks



Kittens should be fully independent by this age. They will stay in care until they reach the target weight of 1.2 kilograms, meaning they are ready to be desexed and find their forever home.

## Temperature guide

| Age range | Rectal temperature | Enclosure temperature |
|---|---|---|
| 0 – 1 week | 35.0 – 37.2 ˚c | 29.5 – 32.5˚c |
| 1 – 2 weeks | 36.1 – 37.7˚c | 27˚c |
| 2 – 3 weeks | 36.1 – 37.7˚c | 27˚c |
| 3 – 4 weeks | 36.1 – 37.7˚c | 22 – 27˚c – (24˚c room ambient) |
| 4 – 5 weeks | 37.7 – 39.1˚c | 24˚c (room ambient) |
| 6 weeks – onwards | 37.7 – 39.1˚c | Comfortable room ambient temperature |

Please keep in mind this is a guide for you to refer to. There is no need to check a kitten's temperature every day unless you believe there is a reason to do so. Kittens should always be warm to the touch, meaning they should have an ideal body temperature. The enclosure and room ambient temperature can be monitored to ensure heating is adequate, especially during the earlier days.

**Mild fever 39.2 – 40˚c**
**Severe fever 40.05˚c**

**NOTE:** All kittens must be weighed daily at the same time each day and preferable when they are 'empty'. They should always be toileted and weighed prior to their first feed of the day to ensure accurate weights are being recorded. Also keep in mind to use the same scales for each kitten and each daily weigh in as you want to ensure as much consistency as possible for accurate reading. A reduction in weight from one day to another can indicate several problems., please call your vet for advice.

# 5. Feeding

Neonate kittens are still developing basic reflexes, it's important to understand that a kitten will not have a gag reflex until they reach 10 – 12 days old. Due to this, you must never force feed. Ensure you are using the correct technique to encourage the kitten to feed, but also being mindful they are not inhaling formula, water or electrolyte solution.



It is very important to only feed adequately hydrated and warm kittens. If you believe they are showing obvious signs of dehydration or otherwise compromised, begin giving oral fluids for 8 – 24 hours and measure urine output as well as the colour (light yellow, clear in colour).

## 5.1. What should you be feeding?

You must only feed neonate kittens a properly formulated milk replacement, such as Wombaroo or Biolac. Please contact your local vet for guidance and  to acquire these products. Do not use anything other than what is recommended, unless directed by your vet . **Do not ever feed cow or goats' milk as a replacement for queen milk.**

When preparing powder formula, it is important to closely follow the directions. This is crucial as it will ensure they are receiving the correct nutritional requirements for their weight and age group. As the kitten grows, you will need to increase the amount of food they receive in each meal and overall daily intake. Some kittens will need separate oral fluids between milk feeds to maintain adequate hydration.

## 5.2. Feeding schedule

The below guide can be used as an approximate feeding guide:

| Age | | |
|---|---|---|
| 0 – 2 weeks old | 10 feeds in 24 hours | Every 2 – 3 hours |
| 2 – 4 weeks old | 7 feeds in 24 hours | Every 3 – 4 hours |
| 4 – 5 weeks old | 5 feeds in 24 hours | Every 4 – 5 hours |
| 5 – 6 weeks old | Should be weaned | 3 meals a day |

| Weight (g) | Feed (mL/day) | Weight (g) | Feed (mL/day) | Weight (g) | Feed (mL/day) | Weight (g) | Feed (mL/day) |
|---|---|---|---|---|---|---|---|
| 80 | 20 | 170 | 34 | 260 | 48 | 400 | 67 |
| 90 | 21 | 180 | 36 | 270 | 50 | 420 | 70 |
| 100 | 23 | 190 | 37 | 280 | 52 | 440 | 72 |
| 110 | 25 | 200 | 39 | 290 | 53 | 460 | 75 |
| 120 | 27 | 210 | 41 | 300 | 55 | 480 | 77 |
| 130 | 28 | 220 | 42 | 320 | 56 | 500 | 80 |
| 140 | 30 | 230 | 44 | 340 | 60 | 520 | 82 |
| 150 | 31 | 240 | 45 | 360 | 62 | 540 | 85 |
| 160 | 33 | 250 | 47 | 380 | 65 | 560 | 87 |

## 5.2. How to feed neonate kittens

1. A large batch of formula can be made in advance. Please ensure you follow instructions on the packaging specific to formula (e.g., water and formula ratio).
   - When making the mixture, ensure the water is not too hot (as it can curdle, resulting in unwell kittens) and not too cold (as this will make mixing the formula very difficult).
   - When making large amounts, formula can be frozen. Freezing in an ice cube tray will make it easier to thaw out in small amounts at a time.
   - Premade formula can be left in the fridge for up to 24 hours, then must be discarded if not used.
   - Once formula has been heated, it must be discarded and not placed back into the fridge or freezer. Reheating formula over and over will cause it to curdle, allowing bacteria and yeast to grow in milk, which can make the kitten unwell.
   - Probiotics can be added into milk formula as directed by your vet, such as fortiflora or protexin.
2. When ready to feed the kitten, heat formula to 35 – 37˚C (testing on the wrist will help give a rough indication if it's too hot or too cold).
   - Be mindful when feeding a large litter of kittens to heat small amounts of formula at a time, as the formula will cool down quickly. If cold formula is fed to a kitten it may cool the kitten down too much and prevent digestion, resulting in gastrointestinal problems.
3. Feed kittens one at a time. When ready, place the kitten on a countertop with a rolled up small towel under its chin. Ensure that all four legs are on the counter and their head is level as this is the position they would feed from their mum.
   - **DO NOT ever feed a kitten while on its back**, as this can cause the formula to travel into the lungs, causing aspiration.
4. Whether you are using a bottle or a syringe, ensure that the teat opening is large enough to allow a steady trickle of formula, but not too large that the kitten can inhale large amounts of formula at once.
5. Kittens have a nursing reflex located on top of their nose. To help stimulate suckling, place one hand over the kitten's head and lay the index finger over the nose. Then introduce the teat by opening the kittens mouth slightly and placing the teat on its tongue. Stroke the kitten from top to tail.
6. Pull lightly on the bottle and allow a slow, steady flow of formula into the teat as this will promote strong suckling.
7. To help prevent inhaling too much air, you can slightly tilt the bottle upwards.
   - Again, do not squeeze the bottle or syringe to force formula into the kitten's mouth.
8. Kittens will naturally stop suckling when they are full and will pull away from the teat.
9. Once they have finished feeding, continue to stroke the kittens back from top to tail.
10. Stimulate each kitten at the end of feeding to both urinate and/or defecate with a warm white cloth.
    - It is important that you use a white cloth or toilet paper to stimulate as you can see the colour of the urine.

⚠ **NOTE:** If you believe the kitten inhaled any of the formula, immediately remove the teat from the kitten's mouth, tilt the kitten slightly downwards and wipe away any excess from the nose and mouth. Please call vet for advice and reduce the flow rate of the teat for the next feed.

## 5.3. Weaning

Weaning is the transition from formula (milk) to solid food and should begin at around four weeks of age. Initially, milk formula can be offered in a very shallow flat dish, encouraging the kittens to lap. If no interest is shown in the bowl, a small amount of formula can be placed on a spoon and gradually lowered to the dish of formula to tempt the kitten. If again no interest is shown, wait a few more days and try again. Once the kitten has shown interest in eating on its own begin to incorporate wet mousse kitten food or soaked kitten dry food.

Firstly, mix a small amount into the milk formula and, again, use the spoon-lowering method to encourage and tempt the kitten. Slowly increase the formula to solid food ratio over the next week.

Once you feel they can eat a sufficient amount on their own, you can begin to introduce dry kibble. Kibble can be soaked in warm water to soften when first introduced. Again, slowly reduce the amount the kibble is soaked in until they can eat on their own. It is important to only make small changes to a kitten's diet at a time as a sudden change can cause intestinal upset, resulting in diarrhoea.

## 5.4. Aspiration pneumonia

Aspiration pneumonia can be a potentially life-threatening condition where food or another foreign object is inhaled into a kitten lung. It can cause irritation and inflammation, leading to the body producing fluid and mucus. The fluid and mucus will build up in the kitten's lung, making it difficult to breathe and causing infection. The most common cause of kittens suffering from aspiration is due to feeding. If the kitten drinks too fast, or they are force fed, they can inhale the formula into their lungs.

The correct feeding technique is very important for young kittens. Generally by the time we know a kitten is suffering from aspiration, it will be too late.

Common signs a kitten is suffering from aspiration pneumonia:

- Difficulty breathing
- Coughing or hacking
- Regurgitation
- Pale or white mucous membranes
- Rattling nose when breathing
- Lethargy
- Fever
- Sudden death while feeding (drowning)

Treatment of aspiration pneumonia consists of oxygen therapy to assist with breathing and intravenous fluids and antibiotics to help stabilise and fight off infection.

## 5.5. Dehydration

Water is essential to cats and especially to a young developing kitten. They depend on a daily fluid intake to maintain health and replace fluid lost through urine and faeces. Water makes up 80 per cent of a cat's body and is necessary for blood circulation, digestion and waste removal.

Dehydration is caused when fluid levels drop below the normal amount, this is due to either a reduction in water consumption, overheating or a bout of vomiting or diarrhoea.

The most common cause of dehydration in neonate kittens is the incorrect ratio when making formula. Often formula can be concentrated. It is a good idea to give water in between each feed to ensure their fluid intake is high enough. It is important not to exceed more then 10 – 20 per cent of their body weight in water or fluids per day.

The easiest way to tell if a neonate kitten is dehydrated is by the urine colour or if they stop producing any urine. Generally, a hydrated kitten's urine will be a clear to very pale yellow colour, whereas a dehydrated kitten will have yellow to orange urine colour, as well as a distinct smell.

Other signs of dehydration include decreased skin elasticity, lethargy, panting (not 'normal' for cats to pant) and elevated heart rate. Depending on the severity of dehydration it can be treated with slow, small amounts at regular intervals of fluids being administered with a syringe, subcutaneous fluids (under the skin) or in severe cases intravenous fluids (through the vein).

# 6. Toileting

Stimulation of kittens who are less than two weeks of age is necessary for them to urinate and defecate. The 'voiding reflex', which is the reflex to pass urine and faeces, is normally stimulated by the mother licking the kitten's ano-genital region (under the tail). In the case of hand rearing kittens, human intervention is necessary for up to four weeks of age or until the kitten is independent enough to pass urine and faeces on their own. When a kitten is in need to pass faeces, it is quite normal from them to cry in distress while being stimulated – this will cease afterwards.

## 6.1. How to stimulate a kitten

To stimulate a kitten, use either a wet wipe (fragrance free), toilet paper or a wet face cloth and gently rub the ano-genital area in circular motions. Kittens will urinate before and after every feed but may only defecate once a day or every second day. Hand-reared kittens can often become dehydrated due to the concentrate of formula, so it is important to use something that allows you to see the colour of their urine. Urine should be a pale yellow colour. If you notice urine that is dark yellow or even orange, the kitten could be suffering from dehydration and this needs to be attended to as soon as possible.

Constipation is also common, if the kitten has not defecated in more than two days and urinated within 6 – 8 hours please call your local vet. Diarrhoea is also common. If it lasts for longer than 12 hours, blood is present, it has a bubbly consistency (may indicate a yeast infection) and/or the kitten is showing signs of lethargy, then please contact your vet.

## 6.2. Transition to litter tray

Once kittens reach between 3 – 4 weeks of age, the 'voiding reflex' should begin to trigger when a litter tray is placed into the nest. Place any solids into the litter tray that have been passed, as this will help as a reminder to perform elimination inside the litter tray. If the kitten is trying to play or eat the litter, or they may still be too young to understand, remove the tray and wait a few more days to introduce. At first it is a good idea to keep multiple litter trays around, especially in spots they are consistently using.

⚠ **NOTE:** Please avoid using clay, crystal and sand-based litter. If eaten, these types of litters will not digest and may cause a blockage.

# 7. Living space

Kittens under the age of four weeks are unable to regulate their temperature, meaning the importance of where they are kept is vital during this time period.

## 7.1. Where to keep kittens

Kittens' living space will change as they grow because they will require more space to socialise and develop into a well-adjusted cat. Kittens under the age of three weeks are to be kept in a small, confined environment, e.g., a cat carrier or a basket with lots of warm blankets and even a soft toy.

Once they reach four weeks and are becoming more mobile, they can be moved into a large space, e.g., a travel cot or play pen with netting over the top to stop kittens from climbing out. Once kittens are fully toilet trained, a room such as the laundry or bathroom can be allocated to the kittens but still provide a warm cosy area with bedding.

⚠ **NOTE:** Please ensure there are no loose threads left in the kittens' housing as they can become tangled within the threading.

## 7.2. How to keep kittens warm

Warmth is essential for kittens under four weeks of age. Kittens are unable to regulate their own temperature, meaning they cannot react to the cold by shivering. Generally, when still with the queen, they will conserve their body heat by direct contact with their mother. In the instance of hand rearing neonate kittens, assistance in helping provide warmth is crucial in their growth and development. The amount of warmth provided decreases over time.

To deliver warmth, simply provide a hot water bottle, electric heating pad or microwave heating pad, keeping in mind to constantly monitor the temperature of the chosen heating device to ensure constant temperature is provided. Do not leave any heating devices in direct contact with a kitten, as they do not have the ability to move away. It is best to place heating devices under a carrier or basket, allowing the heat to warm up blankets and bedding.

The temperature within the carrier or basket should be maintained at 29.5 – 32.5˚C for the first week. At around 7 – 10 days, this can be reduced to 27˚C and by the end of the first month it can be dropped down to 22˚C. It is important to reduce the temperature gradually as a sudden change in temperature can be fatal. Take into consideration the room ambient temperature can have an effect on the temperature within the carrier or basket, maintaining an outside temperature of 24˚C is ideal. A thermometer inside and outside the nest should be constantly monitored and adjustments made if necessary.

⚠ **NOTE:** If a kitten is unable to maintain an appropriate body temperature, increase the basket or enclosure temperature until the kitten is stable again, then slowly begin reducing the temperature back down to appropriate temperature for the kittens' age.

## 7.3. Hypothermia

Hypothermia, where a kitten's body temperature is dangerously low, can be a fatal condition for neonate kittens. The rectal temperature of a newborn kitten is between 35.0 – 37.2˚C, which increases to 36.1 – 37.7˚C in their second and third week and then will reach regular levels of 37.7 – 38.9˚C by four weeks of age.

When regulating each kitten's temperature, it is important to ensure they are staying within the ideal range for their age. If a kitten's temperature drops below 32˚C, they will go into a state of hypothermia and commonly die if not attended to quick enough. It is important that if a kitten's temperature does drop to a fatal temperature, you do not warm them up too quickly, as this can also be fatal. Warm them up slowly by wrapping the kitten in a towel or blanket and gently rub their back.

The easiest way to take a temperature of a kitten is to use a standard thermometer. Simply place a pea-sized amount of lubricant on the tip of a thermometer and insert the tip into the rectum of the kitten, ensuring the tip is resting on the walls of the rectum as this will give the most accurate reading. Leave the thermometer in the rectum, holding it in place until the thermometer makes a nose indicating that the temperature has been read.

⚠ **NOTE:** If you believe a kitten is suffering from hypothermia, you must not feed them, as they are unable to digest and break down the formula causing dehydration. If you believe a kitten is in a state of hypothermia please seek veterinary attention as soon as possible.

# 8. Hygiene

Proper hygiene is extremely important as neonate kittens are prone to infections. Care must be taken with personal hygiene and with utensils used for preparing formula and their living environment.

## 8.1. Personal Hygiene

When handling neonate kittens, it is important to maintain a high level of personal hygiene. A kitten's immune system can quickly become compromised with cross contamination of illness and disease. Clean your hands thoroughly before touching a kitten and after toileting a kitten to prevent cross contamination.

## 8.2. Daily cleaning

Clean the living space, litter tray and bowls daily when the kittens are much more active. Kittens under the age of 2 – 3 weeks are very immobile, which means they will not require much daily cleaning. Kittens over the age over 3 – 4 weeks that are not active and using a litter tray will require daily cleaning of their living space to ensure no solids are left outside the litter tray, the litter tray has been cleared when soiled, dishes have been cleaned between feeds and any soiled bedding is either washed or discarded.

It is of high importance that the hygiene of bottle-feeding utensils is maintained as this is the time period that can be potentially fatal for neonate kittens. When preparing formula, ensure that all equipment has been sterilised. This can be simply done by boiling in clean water on the stovetop or placing used syringes, bottles and teats in a cup of water and microwaving. If a large batch of formula has been made, it can be frozen in an ice cube tray or left in the fridge for up to 24 hours.

Once formula has been heated for a feed, it must be discarded and never reheated. It is important to heat up small portions at a time as the formula will cool down quickly – reheating can cause formula to curdle and encourages yeast and bacteria growth, which can lead to infections and gastrointestinal issues.

⚠ **NOTE:** Ensure all items that have been used for preparing formula are sterilised before they are used again, e.g., syringe, teat, ice cube tray, bowls, etc.

## 8.3. Cleaning the kitten

Kittens under the age of 3 – 4 weeks have not developed the skill of cleaning and grooming themselves. It is important to stroke a kitten from top to tail as it helps stimulate grooming. Bottle fed neonates will often have milk around their mouths, which should be cleaned after each feed with a wet cloth or fragrance-free wet wipe. If milk is left, it can cause a rash-like reaction on the kitten's face. This simple act also helps with being able to tell if a kitten is unwell and regurgitating its formula (this can be an early sign of panleukopenia virus).

In most cases, kittens will not require full bathing. However, kittens can be very messy when learning to eat solid foods, so a quick bath or wipe with a warm wet cloth may be necessary to ensure their faces and feet stay clean, and if they suffer from diarrhoea, cleaning around the anal area. Be cautious when bathing kittens as it can be very stressful and cause them to go into shock from hypothermia. Always fully dry a kitten after a bath.

# 9. Health

## 9.1. Infectious diseases

There are a variety of infectious diseases passed between cats and even mother to kitten. Kittens under the age of 4 – 6 weeks are unable to be vaccinated until their immune system is developed enough. It is recommended to contact your local vet to to discuss an appropriate vaccination schedule and treatment for internal and external parasites. The three main infectious diseases that are vaccinated against are:

### Feline Panleukopenia (FP)

- Feline Panleukopenia, also known as Feline Parvo or distemper, is a viral infection that kills cells in the intestinal tract and bone marrow. The virus rapidly divides and quickly spreads throughout a cat's body. Due to the fast-acting nature of the virus, signs or symptoms may appear until it is too late.
- The virus sheds in all bodily secretions such as urine, vomit and most commonly in stool. The virus has been known to lay dormant in environments for years with sudden outbreaks occurring.
- Once a cat has encountered the virus, it has an incubation period of 3 – 14 days before showing active signs. The virus lasts for 5 – 7 days, affecting kittens under the age of five months the most. The mortality rate, as observed in Sydney, is greater than 90 per cent.
- The most common signs and symptoms of panleukopenia or parvovirus include vomiting, bloody diarrhoea, lethargy, fever, no appetite, low blood sugar, regurgitation, jaundice, occasional respiratory signs and sudden death.

⚠ **NOTE:** If a kitten is diagnosed with parvo, they will be humanely euthanised as there is little to no chance of survival in this age range.

### Feline Calicivirus (FCV)

- Feline Calicivirus is a viral infection of the upper respiratory tract that is like a type of cat flu. The virus is generally spread when encountering an infected cat.
- The virus can also lay dormant in an environment meaning contact with an infected cat is not necessary to contract the virus.
- The most common signs and symptoms of calicivirus include: eye and nasal discharge, ulcers on tongue, mouth, tip of nose, lips and around claws, difficulty breathing, lameness due to inflammation of joints, decreased appetite, fever and occasional neurological symptoms.

### Feline Herpes (FVR)

- Feline Herpes or rhinopneumonitis virus is another form of upper respiratory tract infection also considered another strain of cat flu. It is often transmitted between cats that share the same litter tray and food/water bowls, as it is secreted through discharge for the eyes, nose and mouth.
- Once a cat contracts the herpes virus, it will lay dormant in their system and may be triggered due to stressful situations causing flare ups.
- The most common signs and symptoms of herpes include, sneezing 'attacks', discharge from the eyes and nose, eye ulcers or lesions in and around the eyes, drooling, congestions, fever, loss of appetite and occasionally neurological symptoms.

### Ringworm

Ringworm is a type of fungal infection that affects the skin, fur and nails of cats and particularly affects kittens due to their developing immune system. Ringworm is spread through the shedding of fungal spores and can live in the environment until encountering another animal or even human. Ringworm is highly contagious, zoonotic disease, which means it can be spread from animal to humans.

The most common signs of ringworm:

- Hair loss
- Itchiness
- Flaky skin
- Distinct round ring that is raised from the skin

Cats and kittens can be infected with ringworm without showing any visible signs of infection.

To diagnose ringworm, a black light is used to scan over the cat or kitten's body as the spores will show up as fluorescent. In order to diagnose ringworm officially, a culture must be taken by a veterinary nurse or veterinarian and grown for 14 – 21 days. This is done by rubbing a tooth brush over the cat or kitten, particularly on any scabby areas, and then having the remnants of the bristles rubbed on a screen and incubated to determine if positive for spores.

Treatment of ringworm is very simple and consists of an oral antibiotic administered daily, top spot lotion on any scabs and a bath or wipe down twice weekly with anti-fungal shampoo.

If any members of the family or family pets develop a circular lesion on their skin, please contact your vet as the lesion may not be visible on the kitten but treatment must begin

## 9.2. Vaccinations

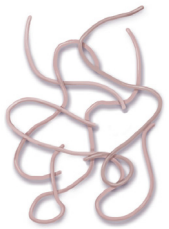
Kittens can be vaccinated from as early as four weeks of age. All cats and kittens should be vaccinated with a live F3 (core) vaccine which covers:

- Feline Panleukopenia (Parvo)
- Feline Calicivirus
- Feline Herpes

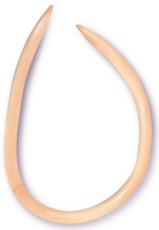
All cats and kittens must receive a minimum of two vaccinations before being desexed. Once kittens have reached at least eight weeks of age and have made weight requirements of 1.2 kilograms, they are ready for desexing.

## 9.3. Parasites

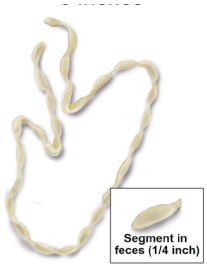
### Internal Parasites



**Roundworms:** If a young neonate or developing kitten becomes infected with a large volume of roundworms, it can stunt their growth and cause severe digestive upset, resulting in excessive gas build up and giving kittens a 'pot-bellied' appearance. Roundworm is contracted by ingesting eggs that are passed in faeces from an infected animal. Cats or kittens with a major roundworm infestation will generally vomit and cough as the worms can move into their lung. If adult roundworms are passed in faeces, they have a white spaghetti-like appearance and can be 7 – 15cm long.



**Hookworms:** Severe infestation of hookworms can cause anaemia in cats (lack of red blood cells). The worms attach themselves to the lining of the small intestine and feed off blood. Cats or kittens suffering from severe infestation will present with pale lips, ears, mucous membranes and nostrils. Hookworm is contracted either by larvae that is passed through faeces and ingested or burrowing through the skin, particularly the feet. Faeces will have a dark, tarry appearance. Adult hookworms are slender and thread-like, growing up to 3 millimetres long.




**Tapeworms:** Tapeworms require an intermediate host in order to complete their life cycle, such as a flea, bird or rodent. For cats or kittens to contract tapeworm, they must eat an infected source, e.g., ingesting an infected flea or rodent. The effects of tapeworm are digestive upset and stunting a kitten's growth. Tapeworm have long flattened bodies that look like tape or ribbons and can grow up to two centimetres long and can often segment (filled with eggs) that resemble a grain of rice.



**Whipworm:** Whipworm can live in an environment for a few months to a few years. It can be contracted by ingesting infected soil, food, water and faeces. This causes digestive upset, bloody diarrhoea, anemia and weight loss. Cats or kittens suffering from severe infestation will present with pale lips, ears, mucous membranes and nostrils. Whipworms have a thicker head and thinner tale that can grow from 5 – 8 centimetres long.

**Heartworm:** Heartworm requires a mosquito as an intermediate host. When a mosquito feeds from a cat or kitten, they may infect the larvae into the bloodstream. As the larvae matures it will travel to the heart and can grow up to 15 – 36 centimetres long. Heartworms are unable to be seen and are diagnosed with the help of a blood test.

**Coccidiosis:** Coccidiosis is caused by the coccidia parasite and, if left untreated, can cause damage to the intestinal tract and organs. The parasite causes mucus-based diarrhoea and vomiting, leading to dehydration. Coccidiosis is generally spread by infected faecal matter but can also be spread by an intermediate host such as rats, mice and birds. Coccidiosis is unable to be seen as it is a one-celled organism that can be detected under a microscope. It is diagnosed with a faecal float that is examined by a veterinarian.

Photos of worms: vet.cornell.edu/departments-centers-and-institutes/cornell-feline-health-center/health-information/feline-health-topics/gastrointestinal-parasites-cats

### External Parasites

**Fleas:** Fleas are species-specific, which means that cats are only affected by Ctenocephalides fleas (cat fleas). Fleas reproduce quickly and can be problematic to eliminate. Fleas can cause itchy and irritated skin, flea allergy dermatitis, anaemia, intestinal worms if ingested, and bacterial infections due to constant scratching of the skin. Flea infestations can cause hair loss due to constant itching and they will often have lots of black flakes through their coat due to flea secretions. Fleas look much the same as headlice.

**Mites:** There are two types of mites that can affect cats: demodex and sarcoptic (can be transmitted to humans). Both types of mites can result in mange if not treated accordingly – mange is the poor condition of a coat such as hair loss, dry flaky skin, itchy red and inflamed skin.

**Ticks:** There are various types of ticks, but the main problem is they carry diseases. Ticks can result in severe allergic reactions and paralysis if not attended to within four hours of entering the cat's skin. Ticks burrow their head into the skin of animals, feeding off blood and releasing toxins into the blood stream. If a tick is noticed, do not attempt to remove yourself as if this is done incorrectly, the body of the tick can be detached from the head. Instead, take the cat or kitten to a veterinarian straight away.

Photo of flea and tick: domyown.com/fleas-vs-ticks-a-446.html

## 9.4. Parasites Prevention

Consult your vet about the best products for kittens, and always follow the instructions on the product packaging.

## 9.5. Desex

Desexing of a kitten is a requirement before being adopted out into their forever home. This cannot be done until a kitten has reached the appropriate weight of 1.2 kilograms and has received a minimum of two vaccinations. Once your kitten has reached the weight of 1.2 kilograms, please speak with the foster care coordinators or foster care veterinary nurse to arrange for the kittens to be booked in for desexing. The most recent vaccinations must occur 7 – 10 days before being admitted back into the shelter. When returning a foster animal for desexing, please ensure they are bought back to the shelter before 3 p.m. the day before the procedure.

## 9.6. Diarrhea

Diarrhoea is a common issue with neonate kittens. It can occur for several reasons but determining the reason is necessary to provide appropriate treatment. A faecal analysis may be necessary in cases where diarrhoea is not resolved with standard treatment. If diarrhoea is not treated appropriately, it will lead to dehydration which can result in a fatality for a young kitten.

### Diet

The most common reason for kittens to suffer from diarrhoea is related to food and supplement. It is important to ensure kittens are receiving the correct kind of formula (milk replacement) and they are not receiving any dairy products such as cows' milk. Always check formula has not expired, been left out of the refrigerator, or spoiled (curdled or spilt). Always discard unsafe formula and ensure the container or bottles have been correctly sterilised.

Premature or incorrect weaning from formula to wet food may cause diarrhoea as the body is not ready to absorb and break down the amount of protein. If you believe a kitten is suffering from diarrhoea due to diet, scale back to formula as the body may need time to readjust.

### Parasites

Diarrhoea caused by parasites can often have a mucus appearance with spots of blood. Parasites such as roundworm and hookworm are common in young kittens, and standard worming treatment will generally help clear diarrhoea. In cases where parasite infestation is severe, worming treatment can be administered up to once every week. This should only be done so if recommended by a veterinarian.

In instances where a faecal float is necessary, other parasites such as coccidia may be the cause of diarrhoea. A course of baycox will be necessary as this is specific to coccidiosis. In conjunction with parasite treatment, a bland simple diet (suggested by a veterinarian) is also necessary as the intestines will need time to recover. Bland diets can only be used for a short period of time as a balanced diet is necessary to growing kittens.

### Underlying medical illness

While the most common causes of diarrhoea are diet or parasites, it can also be caused by medical conditions such as infectious disease and viruses. If a kitten exhibits severe or persistent diarrhea, veterinary treatment should be sought as soon as possible. Kittens have developing immune systems, which means they are unable to fight off illness. In most cases, they generally go downhill quickly, leading to fatality.

# Neonate Daily Weight and Feeding

| Name / ID | Animal 1 | Animal 2 | Animal 3 | Animal 4 | Animal 5 | Animal 6 |
|---|---|---|---|---|---|---|
| Date | | | | | | |
| Weight | | | | | | |
| | | | Feeding 1 | | | |
| Milk Volume | | | | | | |
| Stool / Urine | | | | | | |
| | | | Feeding 2 | | | |
| Milk Volume | | | | | | |
| Stool / Urine | | | | | | |
| | | | Feeding 3 | | | |
| Milk Volume | | | | | | |
| Stool / Urine | | | | | | |
| | | | Feeding 4 | | | |
| Milk Volume | | | | | | |
| Stool / Urine | | | | | | |
| | | | Feeding 5 | | | |
| Milk Volume | | | | | | |
| Stool / Urine | | | | | | |
| | | | Feeding 6 | | | |
| Milk Volume | | | | | | |
| Stool / Urine | | | | | | |
| Notes: | | | | | | |

RSPCA
New South Wales