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HAND REARING KITTENS

Raising an orphaned kitten can be a rewarding experience. However, kittens are very fragile, and raising them can be difficult, time consuming, and it is not always successful.

What kittens need to be hand reared?

Normal kittens have their environmental and nutritional requirements met by their mother. However, a number of different situations may lead to kittens requiring extra care, e.g. death of the queen (female cat), rejection of the kittens by the queen, ill health in the queen, or the production of too large a litter for the queen to care for.

When the queen is only temporarily ill, the kittens may only need to be hand fed for a few days, while in other situations the kittens may need to be fed by hand until they are weaned. In the case of a very large litter where the kittens are gaining some milk from their mother, they will only need supplemental feeding.

Should any kittens not be hand reared?

In some circumstances the breeder may be faced with a decision to have kittens euthanased at birth. Apart from agonising decisions over sheer numbers, or where the queen is unwell or unwilling to look after the kittens, there are some cases where a kitten needs to be euthanased to prevent a crippled existence. No list can be exhaustive, but as soon as possible a check should be made with the following defects in mind:-

1. **Severe hydrocephalus** as shown by enlargement of the skull.
2. **Anasarca or generalised oedema** (water-logging of the tissues).
3. **Cleft palate** which will lead to the inability to suck and dribbling of milk down the nose.
4. **Imperforate anus**. This may be obvious with the entire absence of an exit for the bowel, or occult when the exit leads into a blind sac within the body. An affected kitten may live some weeks but will fail to thrive and will never be seen to pass a motion. In the occult case, the true condition can only be found on close examination by a veterinary surgeon.

5. **Hernia** or incomplete development of the ventral body wall. A small ringed umbilical hernia is a slight defect, but some kittens have virtually no abdominal musculature and should not be kept.
6. ***Spina bifida*** or incomplete development of the dorsal body wall.
7. **Gross deformity** or absence of limbs.

Many serious inherited abnormalities are not obvious at birth, and abnormalities of eyes and hearing fall into this category. Suspected abnormalities of joints and limbs should be viewed with caution unless utterly self-evident, such as severe shortening of a limb. Joints at birth are very incomplete structures and most apparent double-jointedness or rotation of limbs right themselves by the time the kitten is really mobile. The most difficult decision usually concerns the kitten persistently rejected by its mother, despite its apparent normality to the human eye. The choice in this case lies between hand rearing, fostering or euthanasia. The decision can only be made by the breeder after full consideration of the circumstances. An additional consideration is that the rejected kitten may well be a defective kitten (mother may know best) in which case hand rearing may not be successful.

Do hand reared kittens develop normally?

A kitten reared in total isolation from other cats is at risk from developing psychological abnormalities; including nervousness, aggression and a reduced ability to cope with strange surroundings, people or animals. Kittens hand reared in the presence of other cats are less likely to be affected since they can develop by watching the other cats. Because completely hand-reared animals are at a behavioural disadvantage they should not be used for breeding.

What are the basic considerations when hand rearing kittens?

There are several basic functions to be addressed when hand rearing kittens. These include the provision of a suitable clean, warm environment, a suitable feeding regimen, attention to urination and defecation (emptying of the bowels), and attention to general health. The major problems encountered when trying to hand rear kittens are chilling, dehydration and starvation (resulting in hypoglycaemia due to low blood sugar levels). These three conditions are interrelated and close observation is necessary if they are to be noticed, and if occurring, for prompt action to be taken in time. Kittens are very fragile, hence they can become ill and die very quickly.

How should I keep the kittens warm?

Warmth is a primary essential for the new-born. A kitten cannot react to cold by shivering and cannot control its own body temperature. In nature, warmth is obtained by direct body contact with the mother and conserved by the enclosed kitting bed. A new-born wet kitten loses heat very rapidly, hence it is important that they are dried quickly. Kittens can be kept warm by lying them in contact with a warm, well-covered

hot water bottle, and heat can be conserved by covering them with a blanket. Great care must be taken not to inflict contact burns by having the bottle too hot. Acceptable alternatives are veterinary heating pads, and infra-red lamps. The disadvantages of the lamps are that many cats dislike the open bed required for their use, and they may over heat both mother and kittens, so lessen close nursing contact.

The rectal temperature of newborn kittens ranges from 35.0 - 37.2°C in the first week, to 36.1 - 37.7°C in the second and third weeks, and reaches normal adult levels of 37.7-38.9°C by the fourth week. If the rectal temperature drops below 35°C the kitten is likely to die. It is important to warm up kittens slowly, since too rapid warming can be fatal.

The temperature in the kitten box should initially be maintained at 29 - 32°C, but the box should be large enough for the kittens to move away from the heat if they become too hot. If the litter is large, the temperature can be reduced since by huddling together the kittens generate extra heat. The temperature can be gradually reduced to 27°C by 7-10 days and to 22°C by the end of the first month.

Does humidity affect the kittens?

When a low environmental humidity is combined with a lack of regular liquid intake the kittens are at risk of dehydration. An environmental humidity of 55-65 % will prevent the kittens' skin from drying out. Signs of dehydration include loss of skin elasticity and sticky mucous membranes (gums).

What makes a good nest for the kittens?

The easiest way to provide a clean, safe and warm nest is to take a cardboard box, line it with a synthetic fur "Vet Bed", use either hot water bottles or a heating pad for warmth, and placing it away of drafts. "Vet Bed" can be easily cleaned, is warm and comfortable. If this is not available terry nappies or old towels can be used.

I have heard that kittens cannot urinate or pass motions without assistance, is this true?

It is necessary to stimulate kittens' of less than two weeks old to urinate and defecate. The voiding reflex is normally initiated by the queen licking the kitten's ano-genital region. The "foster mother" must therefore imitate this by gently massaging the kitten's ano-genital area with moist cotton wool ball. This should be done after each feed, and each kitten must pass urine and faeces at least once every day.

From two to three weeks of age the reflex should be triggered while the kitten is placed on the litter tray. Leaving a small amount of soiled litter within the tray will serve as a reminder to the kittens of where to perform.

What signs might indicate that the kittens are unwell?

Normal kittens should eat or sleep for 90% of the time for the first 2 weeks of their lives. If they cry excessively, or fail to suckle, they are usually ill or receiving insufficient milk. Since kittens can die very quickly, they (and their mother, if still present) should be examined by a veterinary surgeon as soon as possible to ensure nothing serious is going wrong.

How much milk replaced should I be feeding the kittens?

When the milk supply is inadequate, supplemental feeding is recommended. Where the kittens have been orphaned or the queen is unable to feed them, they will need total replacement feeding. There are several commercial formulae available which are designed specifically for kittens e.g. Divetalac or Animalac. They should be made up and used as per instructions, but at a reduced volume if the kittens are still gaining some milk from their mother (give perhaps 1/2 to 1/3 of the volume). The amount on the label are usually given "as per 24 hours". The quantities should therefore be divided into a number of feeds. Kittens less than 2 weeks of age should be fed every 3-4 hours, while kittens of 2-4 weeks of age can usually be fed every 6-8 hours. The milk should be warmed to 35 - 38°C before feeding (~ the same temperature as the skin of the human forearm).

How do I get the milk into the kittens?

Spoon feeding is slow and requires great practice. Each spoonful must be gently poured into the kitten's mouth. The kitten's head must not be elevated since new-born kittens do not have a well developed gag reflex, and the lungs can easily be filled with milk.

Syringe feeding may be considered in an emergency, but can be potentially lethal. The problem arises when the plunger sticks and then gives way suddenly, squirting a large volume of milk into the kitten's mouth, risking drowning.

Dropper feeding is similar to spoon feeding, but a little quicker and cleaner.

Baby bottles can be bought which are specially designed for kittens. The size of the hole in the nipple is critical. If when the bottle is turned upside down the milk drips from the nipple, the hole is too large, and you risk drowning the kitten. If when the bottle is turned upside down the milk only comes out after considerable squeezing of the bottle, the hole is too small, and its use may result in the kitten becoming discouraged and refusing to nurse. The correct size hole allows the milk to drip from the nipple with minimal squeezing of the bottle. As nipples are used the holes tend to enlarge, so new ones must be introduced. Kittens tend to become fixated upon one particular nipple, so when changing from an old one to a new one they may show reluctance to feed. As the kittens grow the size of the hole in the nipple can be gradually enlarged.

Tube feeding is perhaps the cleanest and most efficient method of hand feeding. However, it requires proper equipment and technical skill. It is a particularly useful technique when a kitten's "suck reflex" is poor, or when kittens fail to suck properly. Some breeders tube feed kittens routinely, however, there are several dangers in this. Firstly, as the kittens have no control over how much they are fed, they can easily be given too much or too little. Secondly, kittens with a strong suck reflex, if deprived of nursing, may suck on each other, and this can lead to the development of large sore areas of skin.

Stomach tubes must be soft, flexible, blunt-ended and not more than 2-3 mm wide. A premature human infant feeding tube is ideal, but short, soft canine urinary catheters can also be used. The tube must be measured to the correct length (from the kitten's nose to just behind the point of the elbow), and a mark made on the tube at this point. The tube should be lubricated with K-Y jelly before use.

To place the tube the kitten's mouth must be opened by pressing gently at the corners, and, keeping the head flexed downwards, the tube is slid along the roof of the mouth and down the back of the kitten's throat into the oesophagus. The tube is passed down until the mark on the tube is level with the nose. The other end of the tube will then be in the stomach. A syringe containing pre-warmed milk can then be attached, and the milk can be delivered slowly to the stomach.

If the kitten's head is kept flexed forward, it is quite difficult to miss the oesophagus and so pass the tube into the airway by mistake. Many kitten's mew loudly throughout the whole procedure, and it is useful to note that they cannot do this if the tube is in the airway. However, anyone unsure of the technique should ask their veterinary surgeon to demonstrate it for them.

Do I need to sterilise all the utensils I use when preparing the milk for the kittens?

Orphaned kittens are very prone to infections so they must always be kept clean, and utensils used for preparing or administering the milk must be sterile.

Should kittens be regularly weighed?

It is advisable to monitor the kittens' growth rates by weighing them at least twice weekly. They should double their birth weight in the first 7-10 days, then continue to gain weight steadily.

What are the signs of hypoglycaemia (low blood sugar)?

Hypoglycaemia results from inadequate or infrequent feeding. It can cause severe depression, muscle twitching and occasionally lead to convulsions. If a kitten is showing signs of hypoglycaemia, a few drops of glucose syrup placed on the tongue can be life saving. This should then be followed by feeding a small amount of glucose solution, and increasing either the amount and/or frequency of routine feeding.

When should the kittens be weaned onto solid food?

Weaning should begin at 3-4 weeks of age. Initially the kittens should be offered milk replacer diluted 1:1 with water, in a flat saucer. They can be encouraged to lap by dabbing their noses with the warmed milk mixture. Once lapping is achieved it is possible to mix a little kitten food into the milk. This is continued until the kittens are taking just solid food. They can be fed either wet or dry diets, but it is best to feed *only* diets designed especially for kittens. Dog food and human baby foods should not be fed since they are deficient in nutrients essential for cats.

What do I do if a kitten become constipated?

Constipation is a very common problem in hand reared kittens, due to the difficulty in stimulating defecation sufficiently frequently. Normal faeces have the consistency of toothpaste. If the faeces become very hard, making the kitten strain excessively, or if a kitten does not pass any motions for 2-3 days, small doses of liquid paraffin or "Katalax" should be given, (~ 0.5 ml per feed for 2-3 days should have the desired effect). Severe cases require veterinary attention.

What do I do if a kitten gets diarrhoea?

Diarrhoea is a serious condition. It may be caused by overfeeding, giving too concentrated a solution of milk replacer, or result from infection (usually caused by poor hygiene). Treatment must be swift as dehydration can then develop very rapidly, followed soon afterwards by collapse and death.

Mild cases respond well to dilution of the milk 1:1 with boiled water, which should be given until the diarrhoea stops. Severe cases should be given no milk at all. Instead they should be given a 5-10% glucose solution, glucose-saline, or isotonic electrolyte solution (e.g. "Lectade"), all of which can be obtained from a veterinary surgeon. These solutions should be given until the diarrhoea stops; milk diluted 1:1 with water, and finally full strength milk can be resumed 12-24 hours later.

If kittens become collapsed and dehydrated they need immediate veterinary attention if they are to survive. Kittens in a collapsed state become chilled very rapidly. They will usually be given subcutaneous fluids by the veterinary surgeon.

Once they have been warmed up and given fluid therapy they must be allowed to recover quietly. Feeding can only be begun once the kitten is warm and able to suck. Stomach tubing is not helpful here, since when a kitten is cold and collapsed its intestines stop functioning, so stomach contents can be easily regurgitated, and then aspirated into the lungs.

As soon as the kitten is able to suck, it should be given isotonic glucose or Lactade solution (at ~1ml per 100g body weight), given every 15 minutes until the kitten is rehydrated and can urinate when massaged. If all goes well, diluted milk can then be introduced after 24 hours, and full strength milk after that.

I have heard that kittens should be given antibiotics to keep them well, is this true?

Unless a bacterial infection is *known* to be present, and antibiotics have been prescribed by the veterinary surgeon, they should *not* be given. Antibiotics severely disrupt the process of normal colonisation of the gut by harmless bacteria, and can, because of this, produce diarrhoea. Antibiotics cannot be used as a substitute for colostrum. If hygiene standards are good, antibiotics are not needed. They are required when navel ill or pneumonia give rise to the ‘fading kitten syndrome’.

When do kittens eyes usually open?

At birth the kittens’ eyes are closed; they usually open within 1-2 weeks. If the closed eyelids become swollen or matted with pus the kitten should be taken to a veterinary surgeon for immediate treatment.

Should kittens be “wormed” regularly?

Since intestinal parasites (“worms”) are common in kittens, all kittens should be treated with drugs to kill the parasites from ~3 weeks of age. Before each dosing the kittens should be accurately weighed, since if too little wormer is given it may not be effective, and if too much is given it may make the kittens ill. In many kittens the worms cause no clinical signs, while in others they can result in poor body condition, soft or bloody stools, loss of appetite, a pot-bellied appearance and weight loss. Some worms can be transmitted through the stools of infected cats, while others are carried by fleas. Good hygiene and flea control are therefore essential. Pyrantel is usually considered the drug of choice for worming small kittens safely.

When should kittens be vaccinated?

Kittens gain some protection from disease in the form of maternal antibodies passed in the queen's colostrum, (the milk excreted in the first few hours after the birth). To ensure that the queen has sufficient antibodies to pass onto her kittens, it is important that she is well vaccinated prior to mating. The protective effect of maternal antibodies lasts for only a few weeks. The kittens' vaccination programme should therefore start from ~ 8 weeks of age, although the exact timing and content of the vaccinations can be tailored to the needs of the particular cattery, as determined by the veterinary surgeon. If the kittens were orphaned, and hence never received colostrum, they will have gained no protective immunity from their mother, and so may need to be vaccinated early, perhaps from 2-3 weeks of age. Most cats are vaccinated against feline enteritis and the viruses that cause cat 'flu. Others are also vaccinated against feline leukaemia virus infection.