

## Practical Tips for Orphaned Kitten Care

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## Orphaned Kitten Physical Exam

EXAM	NORMAL FINDINGS	ABNORMAL FINDING
<b>Weight</b>	<ul style="list-style-type: none"> <li>• Birth: 90-110g</li> <li>• Gain 7-10% of birth weight each day</li> <li>• Weight doubles by 2 weeks</li> </ul>	<ul style="list-style-type: none"> <li>• Underweight for age</li> <li>• Not gaining weight</li> </ul>
<b>Attitude</b>	<ul style="list-style-type: none"> <li>• Bright and alert</li> <li>• Hardly cries</li> </ul>	<ul style="list-style-type: none"> <li>• Lethargic, unresponsive</li> <li>• Cries a lot</li> </ul>
<b>Body condition</b>	<ul style="list-style-type: none"> <li>• 0-6 weeks: Plump and round</li> <li>• Symmetrical body and limbs</li> </ul>	<ul style="list-style-type: none"> <li>• Thin body condition</li> <li>• Taut, over-distended abdomen</li> <li>• Asymmetry of limbs or body</li> </ul>
<b>Coat condition</b>	<ul style="list-style-type: none"> <li>• Hair shiny and free of debris</li> </ul>	<ul style="list-style-type: none"> <li>• Hair loss, skin irritation, cuts, fecal stained hair</li> </ul>
<b>Muscle tone</b>	<ul style="list-style-type: none"> <li>• Strong</li> </ul>	<ul style="list-style-type: none"> <li>• Weak, flaccid</li> </ul>
<b>Rectal temperature</b>	<ul style="list-style-type: none"> <li>• 0-2 weeks: 95-99°F</li> <li>• 2-4 weeks: 97-100°F</li> <li>• 4+ weeks: 100-101.5°F</li> </ul>	<ul style="list-style-type: none"> <li>• Anything below 95°F is abnormal. Warm kittens up slowly at 2°F per hour to prevent organ failure.</li> <li>• Anything above 101°F is a fever</li> </ul>
<b>Heart rate</b>	<ul style="list-style-type: none"> <li>• 220-260 beats per minute</li> </ul>	<ul style="list-style-type: none"> <li>• Slow or irregular heart rate. Chilled kittens heart rate will slow down.</li> </ul>
<b>Respiratory rate</b>	<ul style="list-style-type: none"> <li>• Birth: 10-18 BPM</li> <li>• After 1 week: 16-32 BPM</li> </ul>	<ul style="list-style-type: none"> <li>• Labored breathing (effort increased)</li> <li>• Increased rate</li> </ul>
<b>Reflexes</b>	<ul style="list-style-type: none"> <li>• 0-14 days: Rooting, and suckle reflex</li> <li>• 0-39 days: Elimination reflex</li> <li>• 0-7 days: Gag reflex</li> <li>• 3-17 days: Startle reflex</li> <li>• 6-8 days: Shiver reflex</li> </ul>	<ul style="list-style-type: none"> <li>• Weak, fading kittens will have diminished reflexes.</li> <li>• If chilled – remember that newborn (&lt;6d) kittens do not shiver.</li> </ul>
<b>Oral exam</b>	<ul style="list-style-type: none"> <li>• Palate closed at birth</li> <li>• 2-3 weeks: Incisor 1 and 2</li> <li>• 3-4 weeks: Incisor 3 and canines</li> <li>• 4-5 weeks: Lower premolars</li> <li>• 5-6 weeks: Upper premolars</li> </ul>	<ul style="list-style-type: none"> <li>• Cleft palate</li> </ul>
<b>Mucus membranes</b>	<ul style="list-style-type: none"> <li>• Pink, moist and slippery</li> </ul>	<ul style="list-style-type: none"> <li>• Dark red, dry and tacky</li> <li>• White, pale membranes</li> </ul>
<b>Eyes and ears</b>	<ul style="list-style-type: none"> <li>• 5-14 days: Eyes open</li> <li>• 6-17 days: Ears open</li> <li>• 4-6 weeks: Permanent iris color and normal vision</li> </ul>	<ul style="list-style-type: none"> <li>• Swelling, discharge or pain around eyes or ears</li> </ul>
<b>Abdomen</b>	<ul style="list-style-type: none"> <li>• Slightly plump and enlarges after nursing</li> <li>• 2-4 days: Umbilical stump falls off</li> </ul>	<ul style="list-style-type: none"> <li>• Distended and painful with excessive crying</li> <li>• Redness, pain and/or swelling around umbilicus</li> </ul>
<b>Anus/Genital exam</b>	<ul style="list-style-type: none"> <li>• Present and patent</li> </ul>	<ul style="list-style-type: none"> <li>• Red, swollen</li> <li>• Yellow or green discharge</li> <li>• Not present or patent</li> </ul>
<b>Urinary exam</b>	<ul style="list-style-type: none"> <li>• Dilute yellow at all times</li> <li>• 3-4 weeks: urinating on own</li> </ul>	<ul style="list-style-type: none"> <li>• Dark yellow indicates dehydration</li> </ul>
<b>Gastrointestinal</b>	<ul style="list-style-type: none"> <li>• Responsive to nipple at birth</li> <li>• Interested in solid food at 3-4 weeks</li> <li>• Eating dry food by 8 weeks</li> </ul>	<ul style="list-style-type: none"> <li>• Unresponsive and weak</li> <li>• Poor appetite</li> <li>• Vomiting</li> <li>• Diarrhea</li> </ul>
<b>Ambulation</b>	<ul style="list-style-type: none"> <li>• 1-10 days: forelimb support</li> <li>• 4 days after forelimbs, hind limb support</li> <li>• 16 days: walking</li> <li>• 21 days: normal gait</li> </ul>	

- 1) Greco DS and Partington BT, The Physical Examination and Diagnostic Imaging Techniques, in *Veterinary Pediatrics: Dogs and Cats from Birth to Six Months*, 2<sup>nd</sup> edition, ed, Johnny D Hoskins, WB Saunders Co, Philadelphia, 1995
- 2) Zambelli D, Feline Neonatal Physiology, Behavior, and Socialization, in *Management of Pregnant and Neonatal Dogs, Cats, and Exotic Pets*, 1<sup>st</sup> ed, ed, Cheryl Lopate, Wiley-Blackwell Ames, Iowa, 2012, 145-158.
- 3) Root Kustritz MV. History and physical examination of the neonate, in *Small Animal Pediatrics: The first 12 months of life*, 1<sup>st</sup> edition, ed, Michael E Peterson. Elsevier/Saunders, China, 20-27, 2011

## Orphaned Kittens Temperature Chart

Age of Kitten	Rectal Temperature <sup>1</sup>	Ambient Nest Temperature <sup>2</sup>	Room Humidity <sup>2</sup>
<b>0-1 week</b>	95-99° F	85-90° F	55-60%
<b>2-3 weeks</b>	97-100° F	79-84° F	55-60%
<b>4 weeks</b>	99-101° F	73.5-79° F	55-60%

<sup>1</sup> Rickard V. Birth and the first 24 hours, in *Small Animal Pediatrics: The first 12 months of life*, 1<sup>st</sup> edition, ed, Michael E Peterson. Elsevier/Saunders, China, 11-19, 2011

<sup>2</sup>Casal MC. Management of Orphan Puppies and Kittens, in *Management of Pregnant and Neonatal Dogs, Cats and Exotic Pets*, 1<sup>st</sup> edition, ed, Cheryl Lopate. Wiley-Blackwell, Ames, Iowa, 207-216, 2012.

Increased temperature above range often indicates fever and high likelihood of infectious disease. Caretakers should still check for environmental cause of elevated temperature – too close a heat source, etc.

Decreased temperature is usually environmental in origin and causes neonate's heart rate to go down, and reduces intestinal motility. Mother cat may reject newborns with cold skin.

## Orphaned Kitten Feeding and Stomach Capacity Table

Estimated Age	Weight (grams)	Weight (ounces)	20 Kcal/100 g body weight <sup>1</sup>	Daily volume Commercial milk replacer (ml) Concentration 0.74 kcal/ml*	Stomach capacity (ml) (4 ml/100 g body weight) <sup>1</sup>	Approx. number of feedings per day**
<b>Newborn</b>	50	1.8	10	13.5	2	7
	75	2.6	15	20	3	7
	100	3.5	20	27	4	7
	125	4.4	25	34	5	7
<b>~ 1 week</b>	150	5.3	30	40	6	7
	175	6.2	35	47	7	7
	200	7.0	40	54	8	7
	225	8	45	61	9	7
<b>~ 2 weeks</b>	250	8.8	50	68	10	7
	275	9.7	55	74	11	7
	300	10.6	60	81	12	6-7
	325	11.5	65	88	13	6-7
<b>~ 3 weeks</b>	350	12.3	70	95	14	6-7
	375	13.2	75	101	15	~6
	400	14.1	80	108	16	~5
	425	15	85	115	17	~5
<b>~ 4 weeks***</b>	450	15.9	90	122	18	~5
	475	16.8	95	128	19	~4
	500	17.6	100	135	20	~4
	525	18.5	105	142	21	~4
<b>~ 5 weeks***</b>	550	19.4	110	148	22	~4

<sup>1</sup> Energy requirement and stomach capacity reference: Lawler DF. Neonatal and pediatric care of the puppy and kitten. Theriogenology, 70 (2008) 384-392.

Energy Requirement: 20-26 kcal/100g body weight/day

Comfortable Stomach Capacity: Approximately 4 mL/100g body weight

\* Most commercial milk replacers in the US provide less than 1 kcal/ml (0.74 kcal/ml), acting to increase the volume of milk required to meet calorific needs. This can be problematic in terms of the number and size of feedings given relative to stomach capacity and more likely to result in gastrointestinal disturbances. This may also account for why bottle fed kittens grow slower than kittens that nurse off their mother.

\*\* As the kitten is adjusting well to the milk and the feeding volume, you may be able to increase the volume fed to help reduce the number of feedings per day. This will exceed recommended comfortable stomach capacity and may put the kitten at risk of regurgitation, aspiration and diarrhea.

\*\*\* Kittens at this age are frequently eating some solid food, decreasing the amount of milk replacer required to meet daily calorific requirements. This may result in less frequent milk feedings.

Additional references:

1) Cline J, Cattery Management and Nutrition of the Queen and Her Offspring, in Management of Pregnant and Neonatal Dogs, Cats, and Exotic Pets, 1<sup>st</sup> ed, ed, Cheryl Lopate, Wiley-BlackwellAmes, Iowa, 2012, 15-24.

2) Zambelli D, Feline Neonatal Physiology, Behavior, and Socialization, in Management of Pregnant and Neonatal Dogs, Cats, and Exotic Pets, 1<sup>st</sup> ed, ed, Cheryl Lopate, Wiley-BlackwellAmes, Iowa, 2012, 145-158.

## Orphaned Kitten Emergency Milk Replacer Recipe

RECIPE	INGREDIENTS	DIRECTIONS
<b>Homemade milk replacer for kittens<sup>1</sup></b>	<ul style="list-style-type: none"><li>• 90 ml condensed milk</li><li>• 90 ml water</li><li>• 120 ml plain yogurt (not low fat)</li><li>• 3 large or 4 small egg yolks</li></ul>	Mix all ingredients completely and warm to 97-100° F before feeding.
<b>Emergency home-formulated replacer<sup>2</sup></b>	<ul style="list-style-type: none"><li>• 1 cup (250 ml) cow's milk</li><li>• 3 egg yolks</li><li>• 1 drop high quality oral multivitamin solution</li><li>• 1 tablespoon (15 ml) corn oil</li><li>• Small pinch of salt</li></ul>	Blend uniformly and warm to 95-100° F. Refrigerate between uses.

<sup>1</sup>Peterson ME. Care of the Orphaned Puppy and Kitten, in Small Animal Pediatrics: The first 12 months of life, 1<sup>st</sup> edition, ed, Michael E. Peterson and Michelle A. Kutzler. Elsevier/Saunders, China. 67-72, 2011.

<sup>2</sup>Lawler DF: *Neonatal and pediatric care of the puppy and kitten*. Theriogenology 70 (2008) 384-392.

## Orphaned Kitten Feeding Issues, Consequences and Prevention

ISSUE	CONSEQUENCE	PREVENTION
<b>Improper feeding position</b>	Aspiration of milk into lungs	Position kitten with feet down (sternal) with head slightly flexed and slightly stretched out.
<b>Milk too hot</b>	Burn kitten's mouth/stomach	Check temperature to make sure between 97-100° F. Milk should feel slightly warm when dripped onto back of wrist.
<b>Milk too cold</b>	Chilling of kitten and slowing of heart rate and digestion resulting in gas formation, colic, bloating, regurgitation and aspiration <sup>1</sup>	Check temperature of milk to make sure between 97-100° F. Milk should feel slightly warm when dripped onto back of wrist.
<b>Milk coming out too fast</b>	Vomiting, bloating, aspiration	Make sure milk coming out of nipple is at a drip (1-2 drips per second) and not a stream.
<b>Overfeeding (ad lib feeding)</b>	Diarrhea, bloating, regurgitation and aspiration	Determine stomach capacity and feed accordingly. Comfortable stomach capacity is 4 ml/100 g body weight <sup>2</sup>
<b>Nipple longer than 5/8"</b>	Aspiration into lungs	Use a shorter nipple
<b>Kitten not taking the bottle</b>	Kitten may be chilled	Warm the kitten up slowly 2° F per hour, then try again
	Milk too cold	Warm milk to 97-100° F
	Kitten may not be hungry	If kitten is alert and responsive and acting okay otherwise, wait a half hour to an hour and try feeding again
	Sick, lethargic kitten	Try a drop of Karo syrup under tongue and seek veterinary attention ASAP
<b>Unclean equipment</b>	Diarrhea, vomiting, infection	Clean bottle and nipple thoroughly between feedings.
<b>Sour milk</b>	Diarrhea, vomiting, infection	Store milk replacer in clean storage container in refrigerator for no longer than 24 hours

<sup>1</sup>Fitzgerald KT, Newquist KL, Husbandry of the Neonate, in Small Animal Pediatrics: The first 12 months of life, 1<sup>st</sup> edition, ed, Michael E Peterson. Elsevier/Saunders, China, 44-52, 2011

<sup>2</sup>Stomach capacity reference: Lawler DF. *Neonatal and pediatric care of the puppy and kitten.* Theriogenology 70 (2008) 384-392.

Peterson ME, Care of the Orphaned Puppy and Kitten, in Small Animal Pediatrics: The first 12 months of life, 1<sup>st</sup> edition, ed, Michael E Peterson. Elsevier/Saunders, China, 67-72, 2011

## Orphaned Kitten Daily Weight and Feeding Record

NAME	Kitten 1	Kitten 2	Kitten 3	Kitten 4	Kitten 5	Kitten 6
DATE						
WEIGHT						
ATTITUDE						
Milk volume 1						
Stool/Urine						
Milk volume 2						
Stool/Urine						
Milk volume 3						
Stool/Urine						
Milk volume 4						
Stool/Urine						
Milk volume 5						
Stool/Urine						
Milk volume 6						
Stool/Urine						
Milk volume 7						
Stool/Urine						
TOTAL VOLUME						

**1) Calculate the daily calories needed\***

\_\_\_ body weight in grams X 0.2 kcal/g = \_\_\_ kcal/day

**2) Convert the calories to mL\*\***

\_\_\_ kcal/day divided by 0.74 kcal/mL = \_\_\_ mL/day

**3) Calculate the stomach capacity to determine volume per feeding\***

\_\_\_ weight in grams X 0.04 mL/g = \_\_\_ mL stomach capacity

**4) Divide the total volume by the stomach capacity to determine number of feedings needed per day**

\_\_\_ mL/day divided by \_\_\_ mL stomach capacity = \_\_\_ feedings per day

\* Lawler DF. Neonatal and pediatric care of the puppy and kitten. Theriogenology, 70 (2008) 384-392. Energy Requirement: 20-26 kcal/100g body weight/day. Comfortable Stomach Capacity: Approximately 4 mL/100g body weight

\*\*Most commercial milk replacers in the US provide 0.74 kcal/ml (11.1 kcal/tbs)