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How to Care for Orphaned Wild Mammals Part II

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The following information has been derived from the experiences of wildlife rehabilitations specialists, as well as from journals on this topic. It is important to note that information must be adapted to accommodate the individual animal and consultation with a veterinarian is recommended. This is the second of a two part series of articles on the care of orphaned wild mammals. Part I covered general information, and the care of cottontail rabbits and squirrels.

**OPOSSUMS**

**Age Determination**

<table>
<thead>
<tr>
<th>Age</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td>Size of a bumblebee, naked, unpigmented, ears and eyes closed, well developed claws on toes, about 2 grams in weight.</td>
</tr>
<tr>
<td>2 weeks</td>
<td>About an inch and a half long, naked, pink, ears and eyes closed, eye sockets begin to appear.</td>
</tr>
<tr>
<td>4 weeks</td>
<td>Small finger size with wide snout, no hair, pink, ears and eyes closed.</td>
</tr>
<tr>
<td>6-8 weeks</td>
<td>Finger size with wide snout, finely haired, starting to pigment, ears and eyes slitting open (58-72 days), tail formed, at 8 weeks old will begin to venture out of the pouch.</td>
</tr>
<tr>
<td>10 weeks</td>
<td>Snout elongated, fully furred, ears and eyes open, tail and ears black and pink about palm size.</td>
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</tbody>
</table>

Opossums under four weeks of age are almost impossible to raise successfully. They are basically embryos during this time. Opossums between 4-8 weeks are also difficult to raise. After 8-10 weeks of age, it is possible to raise them successfully.

**Nutrition/Feeding Schedule**

First 3 feedings should be an oral rehydrating formula of 1/2-3/4 cc every hour to two hours.

**Formula #1:**
1 part multi-milk powder to 1 part Esbilac powder. Then mix 1 part powder combination to 1 part water.

**Formula #2:**
1 part powdered Esbilac, 1 part whipping cream and 3 parts water. Formula must be heated to body temp. prior to feeding (94-97°F).

**Formula #3:**
1 part powdered Esbilac, and 3 parts water.

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a dampened Q-tip. For adolescent age opossums (age 75-150 days), it is time to begin the weaning process. Place a shallow, non-spillable dish in the cage containing their warmed formula.

To encourage them to eat on their own, dip their mouth into the formula, they should begin lapping immediately. Another shallow dish of water should also be provided at this time. Provide them with a new dish of formula every 3-4 hours except at night. After a week of lapping formula on their own, it is time to change the formula. Mix in a blender (for 2 minutes) 1 cup dog kibble (high quality) that has been soaked in 1 1/2 cups boiling water with one 14 ounce can of Esbilac. Feed this mixture every 3-4 hours in the small dish. After a week, just soak the kibble in water until soft and pour Esbilac on top, adding hard boiled egg (no shell) and some fruit to the diet. Feed 3 times per day. Continue feeding this diet while slowly decreasing Esbilac until the opossum is eating all other foods well, and is totally weaned from Esbilac (Nave & Lacy, 1983). Opossums are prone to calcium deficiencies, so it is important to feed dog food and egg first, then offer fruit after food has been eaten. Opossums older than 150 days should be offered more natural food as a pre-release diet. Since opossums are omnivorous they should eat anything and everything in the wild. Therefore, offering a wide variety of foods is important. Feed them dead insects and mice or chicks. These may need to be cut open first to entice them away from the dog kibble. Also offer whole raw eggs, a wide assortment of fruits and vegetables, live crayfish, berries and nuts. After a few days of eating dead food regularly it is time for release.

Proper Housing/Management

It is recommended from the beginning to divide litters into 2 or 3 individuals per volunteer. This allows individual attention and avoid volunteer burn-out. Until 10 weeks of age baby opossums can be housed in cardboard pet carriers lined with soft material. Cover all bottom holes with tape (sticky side out). An artificial pouch is important to supply for added warmth and security. The pouch should be 12-15 inches long and 6-8 inches wide and with one end sewn shut. This pouch can be hung like a hammock from the top of the box (Nave & Lacy, 1983). A heating pad, set on low should be placed in the box, and covered with 2 layers of towels. Temperatures should be 85-90°F. Humidity is another important concern when dealing with opossums. A damp sponge or washcloth should be placed in the box and moistened with every feeding. Proper humidity is needed to prevent the opossum's tail from drying and sloughing off. Lanolin, baby oil, or petroleum jelly can be placed on tails to prevent them from drying out.

When the babies reach 2 months of age, they will become more active and it will be necessary to place the heating pad under the box so the babies do not chew on the electrical cord. The box may be lined with newspapers and a towel. The pouch can be discarded and a hammock placed in the box. The bottom of the hammock must be in contact with the bottom of the box for the babies to receive warmth from the heating pad. As they become older, this can be raised off the floor. A towel can be placed in the hammock for them to crawl under. The baby opossums will not eliminate in their hammock and the box can be cleaned without disturbing the sleeping babies. It is recommended that by 3 months of age, opossums be kept individually as they will fight amongst themselves.

When opossums are fully furred and eating on their own (75-150 days), they should be moved to a cage at least 3'x3'x3'. A 1"x1" welded wire is the preferred size. The previous hammock or a new nest box (1"x1"x1") can be placed in one end of the cage. The heating pad can be draped over that part of the cage and covered with a blanket for extra warmth. Branches and logs should be placed in the remaining area.

Exercise is very important to opossums as they can develop cage paralysis. Leave the cage outdoors during the day and night if warm. If cold at night, bring the cage indoors. After 3 days of acclimation, move the opossum to an outside cage (4'x6'x8') made of 1"x1" welded wire. Many branches, logs, a nest box and a large water dish should be provided. After 2 weeks of total outdoor living and eating the appropriate diet the opossum is ready for release.

Handling

Handle only when feeding. Opossums tame relatively easy, therefore, a no speaking policy should be initiated around them. They should not be raised around predator species such as dogs, cats or raptors. Exposure to humans should be kept to the primary caretaker. If any oral medication needs to be given to the older opossums - capture them with gloves and wrap them snugly in a towel so that only their head sticks out. Opossums have 52 teeth and can give a vicious bite.
Common Problems

Respiratory problems are fairly common in young opossums. Avoid drafts and chilling of the babies. The young do make a sneezing sound. It is not a cold but thought to be a call to their mother.

Internal and external parasites are common in opossums. Screen periodically and treat accordingly.

Metabolic bone disease is caused by not feeding a well balanced diet.

A cream colored ocular exudate is normal in opossums.

Release

As stated previously, opossums are ready for release when they have been in an outside cage for at least 2 weeks and eating a natural assortment of food for a week. They should be approximately 4-5 months old and 7-10 inches in length (not including the tail). They should show fear of humans by hissing and running away. As they are nocturnal, they should be released at dusk in a wooded area that has a year round supply of water.

RACCOONS

Age Determination

<table>
<thead>
<tr>
<th>Birth</th>
<th>4-6 inches long with 2-2 1/4” tail.</th>
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</thead>
<tbody>
<tr>
<td>1-7 days</td>
<td>Lightly furred, faint mask and tail rings, ears pressed against head.</td>
</tr>
<tr>
<td>1 week</td>
<td>Crawl with all 4 legs extended, eyelid slit is present.</td>
</tr>
<tr>
<td>2-3 weeks</td>
<td>7-10” long, many vocalizations.</td>
</tr>
<tr>
<td>18-24 days</td>
<td>Eyes and ears open, eyes remain cloudy blue color until 4-5 weeks old.</td>
</tr>
<tr>
<td>4 weeks</td>
<td>12-13” long.</td>
</tr>
<tr>
<td>7 weeks</td>
<td>Proficient in walking, running, climbing and playing.</td>
</tr>
<tr>
<td>63 days</td>
<td>Eating solid foods.</td>
</tr>
<tr>
<td>70 days</td>
<td>Travel with mother.</td>
</tr>
<tr>
<td>112 days</td>
<td>Weaned from mother.</td>
</tr>
</tbody>
</table>

Nutrition/Feeding Schedule

Unlike other mammals, raccoons will overeat when nursing. Therefore, it is up to the rehabilitator to stop feeding when the stomach becomes full, not tight. A 4 oz. pet nurser bottle works well for feeding. As with other mammals, start on rehydrating formula for first 2-3 feedings and ease slowly into regular formula. They are also prone to gas problems, therefore burp after every feeding. Formula should always be heated to body temperature before feeding (100-102°F). Make sure to feed the baby in a “tummy down” position to avoid aspiration.

Formula #1:
(For infant raccoons less than 4 weeks)
1 part dry KMR to 3 parts water.

Formula #2:
(For infant raccoons)
2 cups whole milk
1 can (1 1/2 cups) evaporated milk
2 large egg yolks (strained)
2 tablespoons dark Karo syrup

Formula #3:
(For raccoons 4-8 weeks old)
1 part dry KMR
3 parts water
As baby gets older, gradually add Gerber’s baby cereal, a slice of canned peaches and some natural peach juice and blend to consistency of malted milk.

Formula #4:
(For raccoons 4-8 weeks old)
1 cup KMR recipe
3-3 1/2 cups water
1/2 cup Gerber cereal
1 tablespoon applesauce
1/6 banana
1 egg
Mix well in blender till consistency of malted milk. If this formula causes gas or diarrhea problems, replace banana and applesauce with 3-4 peach slices.

Formula #5:
1 cup Purina High Protein kibble soaked in 1 1/2-2 cups hot water blended with 1-14 oz. can of KMR (Elaine L. Sorensen, 1990).
One day to 3 week old babies should be fed 5X/day; 4-5 weeks feed 4X/day; 6-14 weeks feed 3X/day; 15 weeks plus feed 2X/day with bulk of food given in the evening. Baby raccoons will need to be manually stimulated to eliminate until 4 1/2 - 5 weeks old. Raccoon cubs need to be burped during feeding. Hold them just as if you were burping a human baby.

Solid food should be introduced at 7-8 weeks of age as well as continuing formula feeding. The mainstay of the diet (90%) should include a high quality dry cat or dog food such as Hill's Science Diet or Purina Kitten or Puppy Chow. This can be soaked in formula at first. Initially to get baby raccoons started on solid food, sugar coated cereal, cookies, bread and hard boiled eggs can be used. The remaining 10% of the diet should include a wide assortment of natural foods such as insects, earthworms, nuts, fruits, fish, crayfish, mice (dead and alive), whole eggs, and vegetables. Raccoons are considered omnivorous so the larger the variety of food offered the better. Fresh water should always be available. Once placed in an outside cage (when “fully weaned, about 8-10 weeks), a child’s plastic wading pool should be a part of it. Food such as fish, tadpoles and crayfish should be placed in the pool to alleviate boredom and encourage hunting for food. Rocks and shells should be placed in the pool to improve their manipulative skills.

Proper Housing/Management

As with other young mammals, raccoons with their eyes still closed can be housed in simple quarters. These include a cardboard porta-pet box, or a large aquarium or incubator. Supplementary heat is needed till the babies become thermoregulatory, about the same time as their eyes open. A heating pad wrapped in a blanket, set on low and placed at the end of the cage works wonderfully. The rest of the cage should be covered with a ravel free blanket. From birth to 1 week, temperature should be set at 80-85°F with 50-60% humidity. At 8-14 days old, temperature should be 80°F, and 72°F from 15-30 days old (Evans & Evans, 1985).

When the eyes open is a good indication for when the babies should be moved to a cage. A 64"X30"X32" cage is appropriate for three raccoons between 4-8 weeks of age (Evans & Evans, 1985). As with any cage, ease of cleaning is a major consideration. Food and water will be introduced between 6-8 weeks of age. A nest box is an important part of this cage as well as logs, branches and other toys. Toys are necessary to introduce at this time, as raccoons are beginning to explore their world and manipulation experience is very important for them to learn.

When raccoons are beginning the weaning process (9 to 12 weeks) they can be moved to an outdoor enclosure. Up to 4 raccoons can be placed in a cage measuring 24"X9"X8". Cages measuring 6' wide X 6' high X 12' long are also satisfactory. Adjust the raccoons slowly to their new pen. Let them play in it at first, then leave them for a few hours, then a whole day and then overnight. Wire should be 1"X2" welded wire. Fiberglass panels should be placed on the ends to protect them from the weather (Evans & Evans, 1985). This cage should be set up a naturally as possible. A jungle gym of branches, trees, logs and shelves should be available to promote exercise and coordination. A child’s plastic wading pool should also be supplied (as mentioned above). A nest box should be provided. Outside time is an important aspect of hand-rearing raccoons. They should be taken to wooded areas and allowed to explore on their own. Exposure to ponds, streams and other sources of water will give them invaluable experience in food gathering skills.

Raccoons should never be raised singly. It is important for them to interact with each other, to compete, play and learn social skills. They should never be raised around dogs as this is a natural predator. Human contact should be limited to the main caretakers and voices should not be used around them. In raising raccoons, physical affection is important to them but voices are not. External parasites such as fleas should be treated with a spray or powder that is safe for use on kittens. For internal parasites, see section on “Common Problems.” Hiding food within their cage stimulates them to search and learn hunting skills.

Handling

During the time that raccoons are nursing, affection should be given to them - they thrive on it. As weaning approaches, lessen the interaction between caretaker and babies. By the time they are totally weaned, handling should no longer occur, unless to transport them from one place to another. Always speak in a low, quiet voice when feeding, playing and transporting the baby raccoons.

Common Problems

Raccoons are the normal host for the
roundworm, *Baylisascaris procyonis*. This roundworm is zoonotic. If ingested by an abnormal host, it undergoes an aberrant migration through the body. The eggs hatch, and the larvae migrate to the brain, eyes and other organs. This condition can cause death or paralysis depending on the location and number of worms. Therefore, it is highly recommended to follow these guidelines:

1) Do frequent fecal screens on all raccoons in your possession. If positive, treat with Panacur at .1 cc per pound of body weight each week until release.

2) All cages and nestboxes used for housing raccoons should not be used for any other animals. They should remain strictly for raccoon use.

3) When cleaning raccoon cages, premises, etc. wear rubber gloves and bury or burn all feces.

4) Keep children and pets away from raccoon enclosures.

5) Disinfect unoccupied cages thoroughly between litters. In case of sickness, dog doses for antibiotics are appropriate for use in raccoons.

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**Release**

Appropriate age for release is 16-24 weeks old. They should be released in a natural habitat that possesses an unoccupied den for them to use. A hollow tree is a perfect den for raccoons. Access to water, plenty of natural food, and a feeding station are requirements of a release site. Foods suitable to leave are dry cat or dog food, nuts, and bread. Food should be left everyday for the first 3 weeks; the second 3 weeks leave food every other day; 7 th week - 3X/week; 8th week - 2X/week; and 9th week - once (Hinshaw, 1989).

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**RED FOX**

**Age Determination**

- **Weight 4 oz.**
  - Eyes open, blue in color.
  - Weaned.
  - Eyes change from blue to brown.

**Nutrition/Feeding Schedule**

Rehydrating formula should be given for first 2-3 feedings and slowly introduce regular formula.

- **Formula #1:** Esbilac as per instructions on label.

- **Formula #2:** KMR as per instructions on label.

- **Formula #3:** same homemade formula as for raccoons.

Formula should be heated to body temperature (100-103°F) prior to feeding. If eyes are closed, stimulate them to urinate and defecate after each feeding. Solid foods should be offered at 2 weeks of age. This includes a variety of dry puppy or kitten foods, fresh fruit (honeydew melon, cantaloupe, grapes, apples, cherries, and plums), natural berries, and fresh dead mice or day old chicks. Formula can be fed in a small, pet nurser bottle. Feed babies 4X/day until eyes open. Slowly decrease frequency of formula feedings as fox babies eat more and more solids. Judge for yourself how often is necessary to feed. It is important to offer dead animals to encourage their “cache behavior.” In times of plenty, fox kill more than they need and bury this food (cache). When food is scarce, they dig up these caches to eat. Once completely weaned and in an outdoor enclosure, live prey training should be initiated. Live mice should be offered through release.

**Proper Housing/Management**

Young foxes with eyes closed can be housed just like baby raccoons. Once eyes open, move them to a cage at least 3’X3’X3’. This should have a den with a hole in the top as well as tubs of dirt to practice cache behavior and digging. Plenty of hiding places and toys should also be available. A large dish of water is another necessity.
weaned, they should be moved to an enclosure 4'X8'X6' for climbers and 8'X8'X6' for non-climbers. Live prey killing should be made easy at first and become increasingly difficult toward release. A large tub filled with grass, leaves and live mice should be given as this imitates hunting in the wild. When the babies have become proficient at this most difficult step, they are ready for release.

Foxes should not be raised singly or in the presence of dogs. Human contact should be limited to the main caretaker and voices should not be used around them. As with raccoons, foxes are very intelligent and need toys (rawhide chews, balls) and exercise to keep them busy to develop muscles and hunting skills.

Handling

Foxes easily become too tame and trusting of people, therefore, it is imperative to keep handling to a minimum once they have been weaned.

Common Problems

Internal and external parasites should periodically be screened for and treated as for a dog. It is important to feed high quality cat and dog food as well as whole dead animals to prevent a calcium deficient diet and insure proper bone development.

Release

Release at 14-16 weeks. Fox should run and hide when you approach the cage. They should be able to capture live prey in thick grass at night. A large area of open fields and grasslands in a protected area is a must. A feeding station should be established and food dropped off 3X/week for 3 weeks.

WHITE-TAILED DEER

Age Determination

They are born with eyes open and weighing 3.3-3.7 kg.

Nutrition/Feeding Schedule

An oral electrolyte solution should be started and slowly add formula until feeding full concentration formula within 24-48 hours.


Formula #1:
- Modified Bogue Formula
  1 cup calf manna
  2 pints heavy whipping cream
  1 quart homogenized milk (not low fat)
  Place all ingredients together in large pot and bring to boil stirring constantly. Boil for 5 seconds, let cool by placing pot in cold water bath with ice cubes while continuing to stir. When cool, run through blender until well mixed (3-4 minutes). Store in refrigerator. Warm and shake before feeding. May add a mammal vitamin/mineral supplement for 1 feeding per day.

Formula #2:
- Foremost Doe Replacer - commercially prepared: mix 1 cup of powder to 22 oz. of warm water and put in blender. No added vitamins/minerals needed.

Fawns can be fed with regular baby bottles and nipples.

As suggested by Mary Forness from Hawk Hideaway Wildlife Rehabilitation Center, New York, it is important to raise fawns with as little human contact as possible. At their center, a life sized doe shape was made from exterior plywood and painted to resemble a white-tailed deer. A nursing bottle rack was attached to the area of the udder on the wooden doe. This structure was attached to the inside wall of the enclosure. A door-like opening in the enclosure wall (wooden fence) was made in order for caretakers to slip feeding bottles into the nursing rack without being seen by the fawns. Bottles were put in and replaced until all fawns in the enclosure had eaten their fill.

Feeding schedules were conducted as follows: first 2 weeks, fawns were fed 4 ounces of formula four times daily. The amount fed is increased as the fawn grows till 16 ounces of formula per feeding is given. By four weeks, fawns are cut back to 3 feedings per day. then in a week, feeding is cut down to 2 feedings per day - morning and evening. As one feeding per day is attained, weaning is initiated. Fawns are given formula in large non-tipable pans. This procedure is carried out for the next 3-4 weeks gradually
decreasing the volume. By the last week, formula is fed every other day. Weaning should occur at least 3 weeks prior to release. During this entire time, fresh, natural roughage is supplied to the fawns. By the time fawns are 1-2 weeks old, they should begin to eat solid food. This food is also supplied in low sided heavy pans. By the time fawns are consuming 16 oz. of formula per feeding, they should also be eating an average of 15-20 pounds of fresh roughage including another 3 pounds of wild fruit and berries. It is highly recommended to feed only forage that would be found in a natural environment to help fawns adapt to the life in the wild. Natural foods include smartweed, sumac, strawberry, acorns, all clovers, pickleweed, beans, apple fruit and leaves, elderberry, plum, etc. (WRC Journal, Winter, 1984). Fresh alfalfa or grass hay can also be used to supplement the diet. Fresh water should always be available as well as a mineral/salt block.

Proper Housing/Management

To insure no human interaction, solid stockade type fencing, 6 feet high is recommended. This fencing should be buried 3 feet to insure no predators digging in. A hay trough should be set at one end for browse and forage to be placed in. Forage should be placed through a hidden door in order to keep caretakers hidden from view. A shelter of some sort also needs to be incorporated within the enclosure. This can be a simple covered shelter to protect the fawns from bad weather. Peep holes are necessary to observe the fawns for signs of sickness, injuries, etc. The NWRA (National Wildlife Rehabilitation Association) and IWRC (International Wildlife Rehabilitation Council) have published minimum housing guidelines for selected species. For an enclosure for up to 6 fawns, 30’X50’X6’ or a barn are suggested.

Do not raise a fawn by itself. As a herd species, it needs interaction with others of its kind in order to adapt in the wild. A no talking policy should be initiated when rehabilitating fawns. Fawns should also not be exposed to dogs, as they are a major threat to deer in the wild. The enclosure should be placed in a natural setting so that the fawns do not become accustomed to city noises.

Handling

Once an initial physical exam and full conversion to formula has occurred, fawns should be placed within a fawn compound. This should be the last physical contact made with a fawn until release. If a fawn becomes injured or sick then human contact intervention is needed.

Common Problems

Fawns raised as pets and accepting of human contact are common problems. These fawns are usually also raised around the family dogs. Diarrhea is usually due to overfeeding or too quick a switch to full formula.

Release

Fawns are usually ready for release after 3 1/2 - 4 months. Once weaned and eating natural foods for 3 weeks, fawns are ready for release. Fawns need to exhibit a proper fear of humans as well as dogs in order to be released. A release area should be carefully chosen. It needs to be a large, undisturbed natural area of woods and field with a water supply. Plenty of natural food needs to be present in the area. The group of fawns raised together are released together.

References


