



*Opossum
Orphan Care
Training Manual*

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OPOSSUM ORPHAN CARE



Those of us who have been involved in the care of orphaned or injured opossums have found methods that work for us. Although there is often more than one way to rehabilitate an animal successfully, it is easy to fall into the trap that "our way is the only way." Yet, when a method works, it is also hard to argue with that success. Techniques constantly change, but it is requested that you follow these basic guidelines while working with the Opossum Society of the United States (OSUS). Our goal is to meet the physical and behavioral needs of the animals in our care in order to ensure that they are equipped for survival in their natural environment.

RESPONDING TO A CALL FOR HELP

When receiving a call asking a volunteer to care for orphaned opossums, it becomes imperative to collect as much information as possible in order to adequately prepare for the arrival of the animals. First, obtain the name, address and telephone number of the caller. Ask where the animal was found, when it was rescued and if any food or fluids have been given. Inquire about possible injuries to determine if it might be necessary for you to seek veterinary assistance. Find out the size of the animal by asking what its length is from tip of nose to base of tail. If the infant is small, ask if it is warm or cold. If cold, tell the person how to warm it while it is being transported to you. For example, the individual could fill a hot water bottle or plastic container with hot water, wrap it in toweling so that the temperature of the outside fabric approximates human body temperature. Ask the person to wrap the opossums in a soft fabric such as flannel or cotton knit and place them next to the toweling-wrapped container. Place in a box. Stress the use of ravel-free fabric in order to avoid injuring the animals.

Any person who handles a nondomesticated animal should be warned to take precautions from injury or disease. Occasionally, infant rats or other rodents are brought in and misidentified as infant opossums. All wild mammals can bite, scratch, defecate and infect an existing wound with bacteria which are a potential zoonotic concern to humans. While opossums are relatively benign animals, no one should assume that they are free from risks when handling them.

While you are waiting for the animal, warm applicable fluids to body temperature and prepare the proper housing for the opossum. Upon arrival, always give a brochure to the individual who found the animals or have the transportation volunteer do so when the animal is picked up.

HOUSING FOR INFANTS (BOX OR AQUARIUM)

Housing for infants that have some gray pigment along the backbone, or scant fur, or infants whose eyes are closed should consist of a sturdy box or aquarium which is at least 18" high. An aquarium is preferred, as humidity is much easier to control. Always place a heating pad under the container, not in it, and make sure it is only under a portion of the "nest" area. It is usually set on low when there is a towel under the aquarium. "Medium" setting might be needed for wood or other containers. When using an aquarium, soak a terry-cloth towel in hot water, wring out and place at bottom of the aquarium. Cover with layers of bedding. To maintain humidity, cover the aquarium with a wet towel. The towels must be resoaked as needed. A hygrometer is generally used to monitor the humidity. Place several layers of receiving blankets, T-shirts, or sweatshirts without frays over the pad to avoid burning or overheating the infants. When using a box or any other container for infants, a tall plastic container partially filled with water should be securely taped to the box in the farthest corner away from the bedding. This will prevent spilling and provide humidity. Cover and punch holes in the lid to maintain the humidity inside.

Prepare a sweatshirt sleeve and close it at one end by rolling it or sewing it closed. This sleeve will be the "holding pouch" for the infants. Once the animals have been placed inside, fold the other end of the sleeve underneath to prevent them from scattering. For practical purposes, this setup is called a "POUCH," since it is meant to simulate the adult female's pouch where she carries her young. Examples of other pouches include flannel pillowcases (turned inside out with the opening tucked underneath) and various sizes of pillowcase-type pouches that are made from flannel and have velcro closures across the opening. Always put a small stuffed animal (after removing any hazardous pieces) in the pouch. This enables the opossums to get away from each other if they want and appears to provide security. Always make sure that a single infant has a stuffed animal. Have at least 2 pouches ready for the incoming orphans, and make sure that the heating pad is turned on ahead of time in order to warm the bedding. The temperature underneath the pouch should be checked with an oral or rectal thermometer and should not exceed 95°F.

CAGE SETUP

For infants that have their eyes open and are walking, a cage that has grids of 1/2" x 1" can be used to prevent the animals from escaping. A rule of thumb for caging is: If the head can go through, the body will follow!

Keep the cage clean and dry. Line the floor with newspaper to prevent damage to tender feet. For bedding, use infant blankets, sweatshirts, T-shirts, and layer the fabric so that the animals can crawl under some of the bedding. Terry-cloth towels are never used as bedding for any species because of dangers from the loops and raveling. It is easy for an animal to strangle, lose toenails, or have threads wrap around their digits, causing damage. ALWAYS have a shallow lid of fresh formula in the cage as soon as the opossum's eyes open. Remember to change the formula every 2 to 4 hours, especially during warm weather.

INITIAL CARE

and after handling. If you receive small, cold opossums, it is imperative that they be warmed for up to two hours before giving rehydrating fluids. Carefully check the temperature of the top towel to ensure that it is no higher than 95°F. Don't try to warm the infants too quickly, as you could burn them or cause them to go into shock. Check for injuries. If any serious injuries are found, seek veterinary assistance.

By now, you should have Lactated Ringers[®], Pedialyte[®] or Gatorade[®] (diluted 1:5 parts) which has been warmed to the opossum's body temperature (95°F - 97°F). We prefer Lactated Ringers or Pedialyte, but in an emergency, Gatorade can be used.

If none of these are available, you can make an emergency rehydrating solution by combining 1 qt. hot water, 1 T. sugar, and 1 tsp. salt.

Cool to body temperature before feeding and store in the refrigerator.

A syringe of Lactated Ringers or Pedialyte can be warmed in a container of hot water or in a microwave on low power. Rehydrate the opossums at least three times with any of the above rehydrating agents to cleanse their digestive tract and prepare them for the introduction to formula.

STIMULATION TO EXPEL WASTE

Prior to feeding it is important to manually stimulate the infants to urinate and defecate. Use a warm, damp cotton ball, Kleenex[®] or Q-tip[®] to gently stroke the perineal area

from front to back. Turn as it becomes soiled. Make sure that the stomach is not bloated (taut) before feeding. If you are caring for a litter of 7 or more, do not be alarmed if no urine is expelled from one of the animals, as they sometimes stimulate each other to urinate through touching.

Occasionally, when an infant demonstrates a lack of interest in eating or is fidgety, stimulation will help it relax and cooperate. As the infant grows, it will usually let the rehabilitator know by its actions when stimulation is no longer needed. You may also see stool and/or urine in the cage. They are well furred at this time. Remember to wash your hands with an antibacterial soap after assisting the animals.

Before feeding the opossums, weigh each on an accurate gram scale. This will determine the amount of formula needed to meet each infant's caloric requirements. If the animals are tiny, weigh them together and divide the total weight by the total number of animals in order to obtain an average weight. Check the Daily Feeding Chart for Infant Opossums which is included in this Orphan Care Manual. Infants generally need to be fed 4 to 5 times a day, depending upon how much they weigh and the formula that is used.

TUBE-FEEDING

The most effective and efficient method of feeding infant opossums formula and oral rehydrating fluid is by TUBE-FEEDING. Once you have learned how to tube, you can feed with more accuracy and can care for more animals. Tube-feeding should be OBSERVED before you attempt to do it yourself. Consult your vet or an experienced orphan care-giver who can teach you and monitor your progress until you gain confidence. It is much quicker to tube-feed unweaned opossums than other feeding methods. Accurate weight must be obtained before starting and checked every 2-3 days thereafter. This enables you to check the Daily Feeding Chart for Infant Opossums to determine the proper amount to feed and to keep accurate records of each animal's growth. The amount fed should comfortably fill the stomach. Overfeeding can cause diarrhea or stomach paralysis. Pay close attention to the fullness of the stomach before, during and after feeding. It should be soft to the touch and gently rounded, not hard and taut like a drum.

Sometimes you will be able to see the whiteness of the milk as it enters the stomach. Feeding intervals are generally 4 to 5 times per day. Middle of the night feedings may be necessary for severely dehydrated infants and those with medical problems. A "pinkie" opossum, one that has no pigment and weighs less than approximately 15 - 20 grams, is difficult to hand-rear without a surrogate lactating female. Caring for them is labor-intensive and often ends in failure. It is usually best for all concerned to have these infants euthanized.

MEASURING THE FEEDING TUBE

Wash your hands thoroughly with antibacterial soap before you begin tube-feeding. Use a SOFT rubber #3-1/2 French feeding tube to feed unweaned infants that weigh up to 35 grams. A #5 French feeding tube can be used to feed those that weigh from approximately 36 grams to 60 grams, but some people find the #3-1/2 French feeding tube easier to get down the throat and more comfortable for the animal. Measure the tube for proper placement. Lay the animal on its back and take the tip of the tube and measure the distance from the end of the chest bone to the tip of the nose. Be sure to hold the head straight back in line with the body. At the tip of the nose, wrap a piece of masking tape tightly around the tube. The tape will serve as a marker to prevent you from inserting the tube too far and puncturing the stomach wall or not far enough and possibly entering the lungs. If you enter the lungs rather than the stomach, you risk drowning the infant or

contaminating its lungs with formula and causing bacteria to grow. This will lead to pneumonia and death. Secondly, you could puncture any of the animal's very fragile membranes. To avoid these problems, ALWAYS measure for proper placement and mark the tube with tape. If the tape is not touching the infant's mouth when it is inserted, you may be in the lungs. Withdraw and start again. By being gentle and taking your time, you can avoid problems. Recheck the measurement every few days and mark the tube with new tape as each animal grows.

Attach the tube to a 1cc or 3cc syringe and fill it with formula that has been warmed to the opossum's body temperature. Heat only enough formula for that feeding. Hold the syringe vertically and tap the side until all air bubbles are at the top. Push the plunger on the syringe to release the air and pass the formula into the tube. Make sure that all the air bubbles have been expelled. If necessary, draw more fluid or formula into the tube so that the syringe contains the proper amount to feed the animal.

Hold the opossum with its back in the palm of your hand. Right-handed individuals should hold it in their left hand and left-handed individuals in their right. Grip the head firmly with the thumb, index and middle fingers. The middle finger will also hold the animal's legs down so that it will not be able to pull on the tube. An alternative method is to hold the infant in a standing position on a flat, non-slick surface. If you are right-handed, put your left hand around its body near the base of the head. Position your thumb and forefinger on either side of the mouth under the jaw. Keep the head and tube straight during feeding.

Wipe any formula from the tip of the tube. Moisten the tip with water. Hold the tube near the tip and gently insert it into the front of the mouth, over the tongue, in line with the throat. To avoid insertion into the lungs, keep the head straight and do not extend it when inserting the tube. It may be necessary to use a twisting motion to get the tip over the tongue (or you may need to remoisten the tip with water). Gently slide the tube forward until the tape is against the mouth. Hold the tube in place and keep the mouth completely closed. Slowly insert the formula, making sure to check the fullness of the stomach. NEVER force the tube. It should go down the throat easily. If it does not or if the tube appears to stop, pull back slightly, twist and try again. If the tube comes out of the mouth, remoisten with water and start again. Feed slowly, stopping after each 0.5 milliliters (cc's) and check the stomach during feeding.

After feeding, place the opossums that have been fed in a separate pouch. Two small buckets, each containing a T-shirt, can be placed on a double-size heating pad. The litter is put in one bucket and as each is fed, it is transferred to the other bucket. This keeps any animal from being fed twice. If any infant has a problem, mark the ears (or tail, if ears are turning black) with a colored nontoxic marker so that you can identify that animal. To avoid cross-contamination, feed the marked infant last. It might be necessary to remove this animal from the litter. For even greater accuracy, you can mark each animal's tail with a different color nontoxic marker in order to avoid feeding an opossum twice and to accurately monitor each individual's growth. After feeding, flush the syringe and tube at least six times with very hot water. Allow to air dry.

Many rehabbers successfully boil their tubes for fifteen minutes daily to sterilize, but I have had tubes permanently curl when boiled. It is important to boil any tube that is used on a sick animal or throw it away so that healthy animals are not infected.

SYRINGE-FEEDING

An alternative method of feeding is syringe-feeding which utilizes a 1cc to a 3cc syringe (or larger, if the litter is large) and a Tom Cat catheter or IV catheter without the needle, (available from veterinarians). Shorten the Tom Cat catheter so that the tip is still small in diameter, but not so long as it is awkward. File the tip of the Tom Cat catheter until all the edges are smooth to the touch. Also, remember that these devices are meant for oral use and are NOT safe for tube-feeding. Prior to feeding, it is necessary to rehydrate the opossums.

After a minimum of 3 feedings of rehydration solution (more if an infant is dehydrated), formula should be introduced gradually as follows:

- 3/4 part rehydrating solution + 1/4 part formula
- 1/2 part rehydrating solution + 1/2 part formula
- 1/4 part rehydrating solution + 3/4 part formula

REHYDRATION

When introducing formula, start with 3/4 part rehydrating solution and 1/4 part formula. Give 3 to 6 times before advancing to the next dilution. It is better to go slowly in order to prevent digestive problems. Progress to 1/2 part rehydrating solution and 1/2 part Esbilac® formula and give at least 3 times before advancing to the next dilution. Monitor how well the infants tolerate the formula. Progress to 1/4 part rehydrating solution and 3/4 part formula and give at least 3 times. Finally, progress to full-strength formula. Whenever you change to a new formula, you should follow the above rehydrating method of introducing fluids and formula in order to prevent diarrhea or other digestive problems.

When syringe-feeding an infant, wrap it in a soft ravel-free cloth with its front legs in or out (whatever is comfortable for the animal). Feed the formula one drop at a time. You can gauge the approximate amount fed by the amount in the syringe. Go slowly. It will take 10 minutes or longer to feed each animal. You do not want formula coming out of the nose. If it comes out the nose, blot, hold the animal upside down and gently pat it between the shoulder blades. Sometimes more formula will be expelled. If this occurs, blot it immediately. Check the infant's stomach to see if it is gently rounded, not taut. Flush the syringe and tip at least six times with hot water. If you have a single opossum and cannot locate a litter to place it with, it is essential that you hold and stroke the animal for at least a few minutes after feeding. This will replicate the stimulation provided by the litter and the nurturing that is essential to thriving. You should also place a small stuffed animal in the pouch or bedding with the baby for additional comfort and security. Remember to remove any hazardous pieces from the stuffed animal.

When comparing syringe-feeding with tube-feeding, it is important to remember that tube-feeding is much faster, more accurate, more efficient and less stressful for the animal, despite any apprehension associated with tubing. The time factor will enable you to care for more infants in much less time, and it is often the difference between an opossum that merely survives and one that thrives.

LITTER TRAINING

Litter trays should be introduced when the opossum's eyes have opened, and it is beginning to walk well. Some examples of litter trays are plastic flower-pot saucers that are filled with natural clay cat litter or teflon-coated cookie sheets filled with either clay litter or lined with newspaper and topped with paper towels. The

paper towels absorb urine quickly. To litter train, stimulate the infant over the litter tray. When cleaning the litter tray, leave one stool in it. Opossums quickly learn to eliminate in the litter tray.

WEANING



When infants have their eyes open and are not too wobbly (generally 45+ grams), they can be taught to lap the formula. Lapping is not a natural feeding routine for them, so they must be encouraged. At this point, it is suggested that soft, quilted-type paper towels be placed on top of the newspaper in the feeding area of the cage. This will enable the animal to stand and grip more easily.

Fill a shallow jar lid to the rim with formula. More than one lid or larger lids may be needed depending on the number of animals. When necessary, a tiny drop of Karo® light syrup can be added to the formula prior to heating to encourage self-feeding. Dip your finger in the formula and wipe it around the edge of the rim to attract the animals. Gently touch the mouth of each opossum to the formula. After attempting to self-feed, it may be necessary for you to supplement the infants with additional formula. Check each stomach for fullness. Extend the time between feedings, and put the infants in front of the lids often. Do not assume that all of the litter are coming out of the nest area to eat. Keep shallow lids of warm formula in the cage. Change the formula frequently to ensure freshness. You might find it easier to use a small plastic spoon and put it in the formula. Tip it slightly to the infant's mouth to encourage it to lap.

When the opossums are lapping regularly on their own and hand-feeding has been reduced to once or twice a day or discontinued (approximately 60+ grams), the formula needs to be thickened by adding ground or whole Purina Kitten Chow® ("Original Formula" only) that has been mixed with water. This mixture will be called "chow-pudding." Grind dry Purina Kitten Chow in a blender or food processor. Add a sufficient amount of water to give the chow a pudding-like consistency. Allow the pudding to set in the refrigerator for approximately 10 minutes and check. It absorbs water faster when refrigerated. The whole consistency changes (there should not be any hard chunks). More water or more chow may be added to get the desired consistency. Store the chow-pudding in an airtight container in the refrigerator. Thicken the formula with a small amount of chow-pudding mix (it should resemble formula that has small particles of Kitten Chow throughout). As the animals become accustomed to the taste, increase the amount of chow-pudding. Provide a lid of whole dry Purina Kitten Chow and another lid of Kitten Chow that has been soaked in water 5 to 10 minutes (in whole form). Some animals eat the softer chow more readily. A shallow container of water should be available at all times.

MODIFIED-JURGELSKI DIET



By the time the opossums weigh 80 to 100 grams, introduce the Modified-Jurgelski Diet. This diet consists of 1 part ground, raw beef liver and 9 parts chow-pudding (see "A Nutritious Post-Weaning Diet For The Virginia Opossum" in this manual). The amount of liver is not discretionary. These are precise measurements. Altering the amount of liver or using another brand of kitten food has and will cause metabolic bone problems.

The Modified-Jurgelski Diet can be refrigerated for up to three days. Then it should be discarded. The liver can be frozen in small containers, if tightly wrapped, for up to one month. Offer the Modified-Jurgelski Diet every evening. This is not optional! Some animals take longer than others to acquire a taste for this diet. If they refuse to eat it after several days, offer crickets, which are high

in protein, that have not been contaminated with any insecticides. After eating crickets for several days, they will most likely eat the liver chow. When all of the opossums that are being housed together are consistently eating the Modified-Jurgelski Diet, gradually add small quantities of various fresh fruits and vegetables (add one item at a time). Cut into bite-size pieces prior to offering them to the youngsters. It is important that the animals are eating the Modified-Jurgelski Diet, which is the balanced dietary staple and constitutes 90% of the total diet, before they get fruits and vegetables, which are 10% of the total diet.

DISINFECTING BEDDING, CAGES & DISHES 

Good hygiene is essential to your health and that of the opossums in your care. After feeding, wash all utensils in a solution consisting of 3 T. liquid bleach to a dishpan of hot, soapy water. Rinse thoroughly. A dishwasher can be used for crock bowls, plastic lids and jars. It would also be advisable to wash animal dishes in a container separate from your own dishes. Wash all bedding in hot water with the appropriate amount of detergent and 1/2 c. liquid bleach with each load. A small amount of unscented liquid fabric softener may also be used, or put a Bounce® (sheet that is free of perfume and additives in the dryer). Use a brush to clean the cages with a solution of 1 T. liquid bleach to 1 c. of hot water. Rinse well and allow to dry completely in the sun. The cages should be cleaned thoroughly after each litter's use.

OUTDOOR CAGES/RUNS 

As the infants grow, they need to be transferred to larger outdoor cages. Den boxes with bedding should be placed off the floor. Equip the cage with hollow logs and secure branches for climbing. Cover at least 1/3 of the cage to provide the animals with shade and privacy. Outdoor cages need fiberglass or metal roofs and tarps that can be dropped in inclement weather. If the cages are small, they can be completely covered with a tarp when necessary. It is important not to overcrowd opossums. As the animals grow, they must be moved into larger cages or litters must be divided. The cages must have adequate floor space.

<u>SIZE OF CAGE</u>	<u>NUMBER/SIZE OF OPOSSUMS</u>
Aquarium or Box (18" tall) 34" x 20" x 20" or 3' x 3' x 3'	Litter with eyes closed (5-7) 4" opossums
46" x 20" x 20"	(5-7) 6" opossums
4' x 4' x 8'	(5-7) 6-8" opossums
4' x 4' x 8'	1 juvenile
Runs With Bedding Boxes 7' x 4' x 8'	(10-12) 7-9" opossums
12' x 4' x 8'	(10-12) 7-9" opossums
Housing for Injured Adult 2' x 2' x 2'	
Outside Adult 4' x 4' x 8'	

It is advisable to group the animals before or shortly after their eyes have opened. The larger they are, the more potential there is for problems to occur.

Never house infants together that are not the same size, as cannibalism may occur. Never house a wounded or ill animal with other opossums because of the species' tendency towards cannibalism.

When the opossums are thermoregulating (able to maintain body temperature), self-feeding, and 5 to 6" in body length, they need to be housed outside. Transfer them when the weather is warm and sunny. Once outside, it is important that healthy animals stay outside, regardless of the weather. When the animals are weaned, limit your contact to feeding and cage cleaning in order to prepare them for release. Your goal is to make them forage for food and to be wary of humans. Do not pet the animals. Scatter food around the cage at dusk before they awaken. Since opossums are nocturnal, you only want them to look for food after dark. Do not leave lights on around the cages. You do not want them to be attracted to lights.

RELEASE 

Keep dogs and cats away from the cages. If the opossums have no fear of dogs and cats, they may lose their natural wariness of other animals which could be fatal to them after their release. If the opossums seem overly friendly to you and come out to greet you, try to arrange to transfer them to someone else. A move to an unfamiliar location will generally illicit a more intense wariness of their surroundings.

Opossums should be released when they weigh approximately 1-1/2 pounds and are about five months old (10" to 12" body length from tip of nose to base of tail). Feed a light meal before releasing or forego the meal and provide backup food such as 10 to 20 lbs. of dry dog or cat chow which is scattered in an area that is somewhat protected from the elements. Release after sunset. Make sure that the weather is favorable on the release day and several days thereafter. The release site should have a year-round supply of fresh water, dense brush and abundant natural foods.

Whenever batches of opossums are released, they should be interested in exploring the release area or run away. If any animal returns to the carrier and wants to stay there, tries to get into or on the carrier and is not interested in leaving it or stays near the rehabilitator, it is too immature to release at that time. If at all possible, take it back and give the opossum more time to mature.

The moment of release ends your role as an orphan care-giver for this individual animal or litter. Your reward is knowing that YOU made a difference in the lives of animals that would have otherwise undoubtedly perished without your care and nurturing.

SUBSTITUTE MILK FORMULA FOR OPOSSUMS

OPOSSUM MILK	%SOLIDS	%FAT	%PROTEIN	%CARBO	KCAL/CC
Barker, et al.	23.2%	11.3%	8.4%	1.6%	1.42
Jenness & Sloan	24.4%	7.0%	4.8%	4.1%	0.99
SUBSTITUTE FORMULA (Esbilac powder & Multi-Milk powder)	21.7%	10.5%	7.3%	2.3%	1.33

MIXING INSTRUCTIONS:

1 part Esbilac or Zoologic Milk

Matrix 33/40 (powder)

1/2 part Multi-Milk or Zoologic Milk

Matrix 30/55 (powder)

2 parts water

- Mix by volume (i.e., teaspoon, tablespoon, cup, etc.)
- If water quality is poor, use distilled water
- Values shown are wet matter basis (% of mixed formula)
- Esbilac, Multi-Milk, and Zoologic Milk Matrix powders are mfd. by Pet-Ag, Inc. (800/323-0877 for product questions)

FEEDING CHART						
BODY WEIGHT		DAILY CALORIC INTAKE REQMT.	AMOUNT TO FEED AT VARIOUS FEEDING INTERVALS IN CC'S			
OUNCES	GRAMS	(KCAL/DAY)	(To convert cc's to oz., divide by 28.35)			
			3X DAY	4X DAY	5X DAY	
0.35	10.00	4.43	****	****	****	
0.53	15.00	6.00	****	****	****	
0.71	20.00	7.45	****	****	1.12	
0.88	25.00	8.80	****	****	1.32	
1.06	30.00	10.09	****	****	1.52	
1.23	35.00	11.33	****	****	1.70	
1.41	40.00	12.52	****	2.35	1.88	
1.59	45.00	13.68	****	2.57	2.06	
1.76	50.00	14.80	****	2.78	2.23	
1.94	55.00	15.90	****	2.99	2.39	
2.12	60.00	16.97	****	3.19	2.55	
2.29	65.00	18.02	****	3.39	2.71	
2.47	70.00	19.05	****	3.58	2.87	
2.65	75.00	20.06	****	3.77	3.02	
2.82	80.00	21.06	****	3.96	3.17	
3.00	85.00	22.04	****	4.14	3.31	
3.17	90.00	23.00	****	4.32	3.46	
3.35	95.00	23.96	****	4.50	3.60	
3.53	100.00	24.90	****	4.68	3.74	

How to use this chart: Weigh the animal periodically. Refer to the table on the right and based on the feeding intervals used, feed the corresponding amount shown.

Amount to feed: At least 2 times the basal energy requirement daily. This is approximated by the formula $KCAL\ required = 2x(70 \times body\ wt.\ in\ kg^{0.75})$. **** Indicates that minimum caloric requirements cannot be met with this feeding frequency.

CC's per feeding are based on the fact that the stomach capacity of marsupials will hold a comfortable maximum of 50 to 66 cc's/kg of body weight (5% to 7%). The stomach may hold more, but distension problems are likely if this range is exceeded. This chart is based on 60 cc's/kg of body weight. **THE CHART IS A GUIDELINE, NOT AN ABSOLUTE.**

Infant opossums are generally able to lap by 45 to 50 g (1.6 to 1.8 oz.). This species is used to nursing in the pouch of the female. In captivity, the animal should be taken from the nest area and placed in front of a shallow container of warm formula every 3 to 4 hours during the day and evening until it is eating well on its own. Formula can also be left out during the day if it is replaced frequently. Supplemental tube-feeding may be necessary. Opossums can generally be weaned by 100 g (3.5 oz.). They can be released when they are self-feeding, acclimated to the outdoors, and measure 10" to 12" (tip of nose to base of tail).

Barker data for opossum milk is from "Marsupial Biomodule Evaluation Study," Life Sciences Operations, Space and Information Systems Division, North American Aviation, Inc., El Segundo, California, February, 1967. Jenness & Sloan data for opossum milk is from "The Composition of Milks of Various Species: A Review." Dairy Sci. Abstr., 32(10): 599-612, 1970.

Portions of this chart have been adapted from data by Richard H. Evans, DVM (1982, 1987) and Murray E. Fowler, DVM (1979).

FEEDING CHART FOR THE MODIFIED-JURGELSKI DIET FOR OPOSSUMS
(PURINA KITTEN CHOW ORIGINAL FORMULA, WATER, RAW BEEF LIVER)

INSTRUCTIONS

Diet: Mixture of 1 part ground, raw beef liver and 9 parts Kitten Chow/water mixture, all by volume (i.e., tsp., tbsp., cup, or parts of any of these). Soak Kitten Chow in enough water to create a pudding-like consistency. Combine 1 part ground, raw beef liver with 9 parts Kitten Chow/water mixture. The amount of liver is not discretionary. Supplemental vitamins/minerals should not be used with this diet.

Diet Composition	%SOLIDS	%FAT	%PRO	%CARBO	KCAL/TBSP
	32.5%	3.3%	13.9%	1.6%	21.2

FEEDING CHART

BODY WEIGHT		BASAL CALORIC REQUIREMENT (KCAL/DAY)	AMOUNT TO FEED PER DAY	
			2 TIMES BASAL REQUIREMENT Tablespoons/Teaspoons (3 tsp. = 1 T) (To convert to cups: 4 T = 1/4 cup)	2-1/2 TIMES BASAL REQUIREMENT Tablespoons/Teaspoons (3 tsp. = 1 T)
OUNCES	GRAMS			
2.5	70.0	9.5	1 T + 0 tsp	1 T + 0 tsp
2.8	80.0	10.5	1 T + 0 tsp	1 T + 1 tsp
3.2	90.0	11.5	1 T + 0 tsp	1 T + 1 tsp
3.5	100.0	12.4	1 T + 0 tsp	1 T + 2 tsp
3.9	110.0	13.4	1 T + 1 tsp	1 T + 2 tsp
4.2	120.0	14.3	1 T + 1 tsp	1 T + 2 tsp
4.6	130.0	15.2	1 T + 1 tsp	1 T + 2 tsp
4.9	140.0	16.0	1 T + 1 tsp	2 T + 0 tsp
5.3	150.0	16.9	1 T + 1 tsp	2 T + 0 tsp
7.1	200.0	20.9	2 T + 0 tsp	2 T + 1 tsp
7.9	225.0	22.9	2 T + 0 tsp	2 T + 2 tsp
9.7	275.0	26.6	2 T + 1 tsp	3 T + 0 tsp
11.5	325.0	30.1	2 T + 2 tsp	3 T + 2 tsp
13.2	375.0	33.5	3 T + 0 tsp	4 T + 0 tsp
14.1	400.0	35.2	3 T + 1 tsp	4 T + 0 tsp
15.9	450.0	38.5	3 T + 2 tsp	4 T + 2 tsp
17.6	500.0	41.6	4 T + 0 tsp	5 T + 0 tsp
19.4	550.0	44.7	4 T + 0 tsp	5 T + 1 tsp
21.2	600.0	47.7	4 T + 1 tsp	5 T + 2 tsp
22.9	650.0	50.7	4 T + 2 tsp	6 T + 0 tsp
24.7	700.0	53.6	5 T + 0 tsp	6 T + 1 tsp
26.5	750.0	56.4	5 T + 1 tsp	6 T + 2 tsp
28.2	800.0	59.2	5 T + 1 tsp	7 T + 0 tsp
30.0	850.0	62.0	5 T + 2 tsp	7 T + 1 tsp
33.5	950.0	67.4	6 T + 1 tsp	8 T + 0 tsp
37.0	1050.0	72.6	6 T + 2 tsp	8 T + 2 tsp

Notes:

How to use this chart: Weigh the animal periodically. Refer to the table on the right and feed the corresponding amount shown. THIS CHART IS A GUIDELINE, NOT AN ABSOLUTE.

Basal metabolic energy represents the energy produced by the animal to carry on basic bodily functions (i.e., respiration, circulation, glandular function, peristalsis, temperature regulation) when in a resting and a thermal neutral state. Requirements for growth are at least 2 times the basal requirement (Murray E. Fowler, 1979). This chart includes calculations for both 2 and 2-1/2 times the basal requirement.

The amounts shown are for one opossum. For more than one animal, multiply the amount to feed by the total number of animals.

PRODUCT GUIDE 

<u>PRODUCT</u>	<u>SOURCE</u>
Esbilac [®] , Pet-Ag Multi-Milk [®] , Pet-Ag Zoologic [®] Milk Matrix (Manufactured by Pet-Ag, Inc.)	UPCO 800/254-UPCO UPCO 800/254-0877 UPCO (10% discount to rehabilitators who provide Permit #, letterhead or business card)
Meyenberg [®] Powdered Goat Milk (Manufactured by Jackson-Mitchell, Inc.)	800/343-1185 (Members of OSUS can request "breeder's" price)
LavaPac (Manufactured by Vesture Corp.)	910/495-7002-Vesture Corp. 910/498-7000-Vesture Corp. (Seasonally available from Wal-Mart)
O-Ring Syringes	Feeding Tech 800/688-0850 The Pet Book Shop 516/922-1169 (No shipping charge for rehabilitators)
Sovereign #3-1/2 & #5 French Feeding Tubes #5 French & #10 French	Available from veterinarians Available from Foster Smith 800/826-7206
Tom Cat Catheters	Available from veterinarians
Lactated Ringers [®]	Available from veterinarians Omaha Vaccine 800/367-4444
Pedialyte [®]	Grocery or drugstore