

Slide 1: Rehabbing Opossums 101

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Slide 2: Topics to be discussed

- Goal of Rehabbers
- Opossum Facts
- Growth & Development
- Where do the Babies Come From?
- Having a Mentor • Rehabbers Golden Rule
- Weighing & Hydrating
- Feeding/Formula
- Tube Feeding
- Teaching to Lap
- Possum Foods
- What do possums eat in the wild?
- Housing and Caging
- Parasite Control in your cages
- Stress in Opossums
- Diarrhea & Poop
- Medical Issues to Watch For
- Enrichment
- Recordkeeping
- Sanitation
- Normal and Abnormal Behavior
- Releasing your Opossums
- Misconceptions about Opossums

Slide 3: Wildlife Rehabilitation

The process of restoring a wild animal to its natural habitat after being cared for in captivity

Slide 4: Goal of a rehabber

Release, release, release

Slide 5: Opossum facts

- North America's ONLY marsupial
- Eats thousands of ticks every year along with other insects
- Will eat dead or decaying carcasses
- Rabies? EXTREMELY RARE: Low body temp
- Short life span in the wild
- Continue to grow throughout their lives
- Immune to venomous snakes
- Nocturnal behavior & solitary
- Size of a honeybee at birth/weight about .16 grams

- Have 1-3 litters per year
- Females are called Jills, males are Jacks, babies are Joeys
- A group of opossums is called a Passel
- Prehensile tail and opposable thumbs
- Have 50 teeth – more than any other North American mammal

Slide 5: Development overview

- 13 day gestation
- Born blind, hairless and partially formed. Brought to term in mom's pouch
- Breathe through their skin
- Must climb into pouch and attach to nipple, first 13 get to stay....
- Remain in pouch for 2 months and finish their development
- Will then start to venture out of the pouch and ride on mom's back
- After about 100 days old, they are weaned and can begin to fend for themselves

Slide 7: These littles were removed from a dead mom's pouch. They were 8 grams.



Slide 8: Opossum growth and development

Birth – 4 weeks

Under 25 grams

Babies are born embryonic and the size of a bumblebee.

Their mouths are sealed and the esophagus is paper thin.

Tube feeding these babies is difficult and can easily tear the esophagus and cause their death.

4 to 6 weeks
25 - 45 grams

Skin is turning grey as fur is starting to emerge, mouth opening.
Initial feedings are every 2 hours with 2 feedings during the night.
Incubators are needed to provide a moist warm environment (like mom's pouch).
Babies begin to release mom's nipples between 30-42 days.

7 to 8 weeks
45-100 grams

An 8 week old opossum is comparable to a placental mammal at birth.

Slide 9: Opossum growth and development

9 to 10 weeks
~100-400 grams

The youngsters are eating on their own.

If in the wild, they might be all on their own.

During rehab, these babies will still be in an inside cage. There will be a lot of growth during this time.

10 weeks to release
400-500 grams

This stage is an outdoor stage.

Opossums can usually be moved to an outdoor cage between 400-500 grams (once they are eating solids).

Release

Release opossums when they are between 10-12 inches from nose to base of tail.
They should weigh 2.5 lbs. or more.

Slide 10: How do babies come into our care?

- Orphans: from tree cutting or clearing land
- Public calls: "I found a baby eating my cat food"
- Dead mother on side of the road
- Separated from mom: by predators, cars, or they fall off the mother
- Veterinarians: receiving babies found from the public
- Trapped by wildlife removal service

Slide 11: Mentorship

- A mentor is an experienced rehabber who can help you to begin down the path of successful wildlife rehabilitation.
- Some states require that you work under a licensed mentor for 1-3 years.
- A mentor is invaluable to the new rehabber for ongoing guidance, motivation, and support.
- Having an experienced mentor could be the difference between life or death for your babies.

Slide 12: What to expect when you bring home an opossum

- You will need a space in your home with natural light that is quiet and away from your busy household
- Tubs/Cages/heating pad ● Daily food preparation – hope you enjoy cooking and food prep
- Keep good records/daily weighing
- Build a release cage....
- How long will you have them?
- Planning and finding a site for their release

Slide 13: Rehabbers golden rule

1. Warm
2. Weigh
3. Hydrate
4. Feed

Slide 14: Weighing your babies

- Example of a good weighing station
- Weigh your baby daily to track growth and to determine how much to feed.
- Stimulate first, then weigh
- Your opossums should gain or maintain weight daily.
- When weighing older opossums, use a hermit crab box to contain them temporarily while weighing
- Dramatic weight loss could be a red flag

Slide 15: Hydrating

- How to Determine Dehydration:
- Skin turgor/tenting skin
- Sunken Eyes ü Yellow or No Urination
- Pale & dry mucous membranes
- Scaly skin
- Dirt in and around mouth
- Listlessness

How to Hydrate:

- Orally and Subcutaneously (SubQ)
- Hydration fluid, FV Electro-stat, Pedialyte, Lactated Ringers Solution (LRS), (always warmed up), etc.
- SubQ for severe dehydration or for those who have difficulty swallowing oral fluid
- % dehydration x Body weight in grams = ml needed in 24 hours, try to give hydration every couple hours for the best results
- Monitor urination/amount and color

Slide 16: Feeding

The Opossums Special Diet:

Opossums have very unique dietary needs. They are omnivorous, consuming both animal and plant

material. You would think since they eat garbage and dead things in the wild, that they would thrive on any and all foods we feed them. However, when in captivity, their diet needs to be taken very seriously. They must have a certain amount of calcium and phosphorous in the diet with a specific calcium to phosphorous ratio (Ca:P). The desired ratio is 1.5:1. How do you navigate this? There is NO commercially available diet correctly formulated for the opossum. So I will try to break it down for you with different foods and recipes to raise healthy, happy babies.

Slide 17: How to get to full strength formula

- Work up to full strength formula VERY slowly (the smaller the baby, the slower you go)
- Start new intakes with hydration fluid
- Never dilute formula with LRS or hydrating fluids
- Include lactase drops in formula (read directions!) Babies are lactose intolerant
- Back off strength if signs of diarrhea
- Keep watch on color and consistency of poop

Slide 18: Mixing formula

- Always mix fresh formula daily and heat up only the amount to be used at that feeding and discard any unused formula
- Refrigerate formula for at least 4 hours before using
- Add lactase drops for babies under 60 grams (follow directions)
- Stir formula well before using, avoid shaking (creates air bubbles)
- Warm up formula in a hot cup of water, never in a microwave
- Use bottled water/Smart Water/for consistency

Slide 19: Tube feeding



- Opossum babies do not have a sucking reflex, and so for this reason, tube feeding is needed for babies until they are lapping.
- Tubing is NOT for the beginner opossum rehabilitator
- After rehabbing for a period of time, ask an experienced rehabber to train you to tube feed.
- Special tubes and supplies are needed to successfully tube a baby. The tubes you see here are the

clear umbilical catheters Tube Sizes: 2.8 and 3.5 single lumen. Never use the red tubes, they are barbaric and stiff – they are double lumen and cause damage to the esophagus and can aspirate small babies

Slide 20: Feeding a litter

- Use a 2 bin system to place babies that have been fed
- Mark your babies to be able to tell them apart
- Always stimulate before and after feeding
- Always weigh each baby each day to track their development

Slide 21: Teaching to lap

- When they can walk, they can start to lap
- Offer a cut up apple or banana to start them licking
- Mix applesauce in with a little formula
- Offer yogurt
- Rub formula on their mouths/faces
- Put them into low dish of formula to get it on their feet
- They will clean each other off

Slide 22: After formula: possum pudding and possum stew

Possum Pudding: Introduce around 100 grams (to be mixed in blender)

- 1 cup FV 25/30 powder + 2 c hot water
- 1 raw egg with shell
- 1 small jar chicken baby food
- 1 Tbls. plain yogurt (carrageenan free)
- ½ cup dry dog food (soaked in water)
- 1 cup veggies (start with one and gradually add a variety of veggies)

Helpful tip: Pour leftover pudding in ice cube trays and freeze until you are ready to use them

Slide 23: After formula: possum pudding and possum stew

Possum Stew: Introduce around 300 grams (to be mixed in blender)

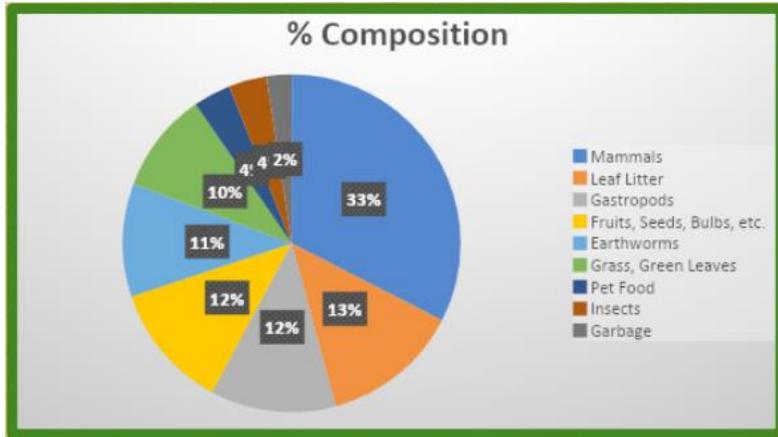
- 2 cups water
- 1 raw egg with shell
- ½ c. plain yogurt (carrageenan free)
- 1 cup dry dog food (soaked in water)
- 1 cup veggies (start with one and gradually add a variety of veggies)
- 3 raw chicken thighs, skin removed with bones
- ¼ tsp. calcium (crushed egg shells)

Helpful tip: Make large batch and freeze in containers to be thawed as needed

Slide 24: types of dry food

Mazuri Exotic Animal Nutrition
Purina Beyond Superfood Blend
Purina One Tender Selects Blend

Slide 25: Foods found in wild opossums



Slide 26: Solid foods: Do's and don'ts

Do's:

- Cooked or raw sweet potato
- Raw chicken with bone
- Broccoli, cauliflower, spinach, kale, zucchini, cucumbers, peppers, asparagus, tomato, mushrooms ●

Yogurt, cottage cheese, mozzarella cheese

- Avocado
- Dark leafy greens in moderation
- Livers and hearts in moderation
- Pumpkin
- Raw fish/smelt
- Raw or cooked eggs with shell
- Tuna, salmon, sardines
- Crickets, mealworms, etc. from pet store
- Feeder mice, cockerels
- Fruit in moderation

Don'ts:

- Cooked chicken bones
- Processed meats
- Beef or pork
- Insects/worms/etc. from the wild
- Processed foods: pasta, bread, cereal, etc.
- Food high in sugar
- NO MEAT WITHOUT BONE, EVER

Slide 27: Housing stages of cages

Always size appropriate, Always hidey/nest boxes, Never overcrowd!!

Slide 28: Carriers and tots

Slide 29: Housing indoors / stages of cages

Slide 30: Indoor housing

Infant Housing: Phase 1

- Small tub with mesh lid.
- Ravel free light colored fleece, don't use terry cloth towels
- Keep 1/2 of tub sitting on top of a heating pad on lowest setting Heating pad must NOT have "Auto" shutoff
- Provide pouch type fleece for babies to burrow in/fleece hat

Slide 31: Indoor housing

Phase 2 Housing:

- Large tub with mesh lid
- Raise in groups of 3 or more if possible. They rely on the resources of the "litter" mentality.
- Provide plenty of space to hide/nest boxes, limbs to climb, and explore
- Provide heating pad until they can thermo-regulate
- Give plenty of natural sunlight
- Introduce small food bowls
- Introduce potty pan (shallow dish with water)

Slide 32: Indoor housing

Phase 3 Housing:

- Large indoor cage: Critter/Ferret Nations are a good choice
- Larger nest boxes with fleece
- 2 ½ - 3" diameter hardwood branches for climbing
- Newspaper for lining cage (No cedar chips)
- Small food bowls for offering more solid foods
- DO NOT mix babies over 100 grams
- DO NOT overcrowd babies. Make sure there is plenty of room to move around, climb, and sleep
- Babies can be moved outside once they reach 400-500 grams and are eating solids

Slide 33: outdoor housing

- Requirements: 4'x4'x8' for a release cage – ½" wire mesh with a solid roof
- Pick a shady area of yard with some filtered sunlight
- Secure release cage to ground or nearby tree
- Provide solid footing - no bare mesh on floor or on shelves
- DO NOT overcrowd
- Provide plenty of branches for climbing
- Provide plenty of hiding places/nest boxes/leaves/rotten logs/moss
- Place nest box high in cage with ramp or branches for access
- Use leaves or straw for bedding (no hay, cedar or wood chips)

- 3+ weeks minimum in outdoor release cage
- 2.5-3.0 lbs. at release

Slide 34: Outdoor caging

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Slide 35: Outdoor cages



Slide 36: Potty pans

Lapping babies over 45 grams can be litter trained with a potty pan. This makes clean up easy. They will continue this practice through release.

Choose a shallow dish that cannot tip over and is large enough for the opossum to stand in. Ceramic or glass pans work well.

TIP: you can add apple cider vinegar to potty water. This will:

- Keep bacteria from growing
- Is a natural probiotic (they might drink from this pan)
- Once outside, the vinegar solution kills mosquito larvae
- Browse local thrift stores for these pans

Slide 37: Parasite control

- Always keep your cages clean
- Use clip on fan to help blow bugs away from food or feces
- Use food grade diatomaceous earth around base of cage
- Use vinegar solution in potty pans for mosquitos
- Treat opossums and/or cage for fleas
- Ants can be a major problem when possums are outside. Place food bowl inside a larger dish with water
- This moat will keep ants away
- Feed only at night
- DO NOT use bug spray on opossums or around their cage

Slide 38: Stress in opossums

Possums do get stressed. Stress significantly contributes to increased morbidity and mortality. It can cause their immune system to be compromised, opening them up to illness and injury. Try to prevent stressful situations. Don't overcrowd. Don't house them in a high traffic area of your home or yard. Cannibalism and self mutilation can be caused by stress. Weight loss, panting and pacing, excessive preening, diarrhea, and aggression. Provide enrichment to reduce boredom while in your care.

Slide 37: Causes of diarrhea

- Overfeeding or feedings too close together is the most common cause
- Overheating from heating pad or hot/humid air temperature
- Overall stress
- Formula too hot or too cold
- Old formula
- Wrong formula (can't digest)
- Lactose intolerance
- Changes in the milk formulas by manufacturer
- Dehydration
- Parasites
- Antibiotics
- Using probiotic too often

- Introducing too many solids too quickly
- Unsanitary feeding utensils or bedding

Slide 39: Good poop vs bad poop

A good poop will look like it came out of a tube of toothpaste. Dark green to brown in color.

A bad poop could be light in color and very loose. Light poop indicates that your baby is NOT absorbing its food.

Slide 40: Common medical issues to watch for

Metabolic Bone Disease: if you notice your opossum is not moving right:

- Crouching “walking on eggshells”, decreased appetite
- Bent crooked limbs

Cuts or wounds:

- Can sometimes be an indication of overcrowding which can lead to cannibalism
- Can also be necrotizing fasciitis, flesh eating bacteria, dermal septic necrosis, etc.

Skin Issues:

- Any and all that look out of the ordinary, red spots, crispy ears. In all of these cases, separate your opossum from others and seek medical advice.

Bloat: when abdomen is distended.

- Very tight abdomen. Can't poop or pee. Take very seriously. Stop feeding and seek medical advice.

Aspiration Pneumonia:

- From aspirating formula into the lungs.

Slide 41: Metabolic bone disease (MBD)

What is it?:

A serious disease resulting in severe crippling or death. Affects the skeletal system, making it weak and causing severe pain that prevents the opossum from being able to move properly

What causes it?:

Poor diet: Deficiency in calcium, vitamins A and/or D which leads to bone calcium loss.

Common when untrained “good Samaritan” wants to keep an opossum as a pet

What is Genetic MBD....? Cannot absorb proper nutrition/calcium...

Reversing MBD?

If MBD is caught early enough, it can be treated and reversed. The diet must be corrected and supportive care offered (pain management). Feed a high quality, balanced diet with sufficient calcium and a proper Ca:P ratio.

Offer daily sunlight....

Opossums are NOT always releasable after recovery

Slice 42: Enrichment

With any animal in captive care, for short term or long term, it is important to offer some nutrition and entertainment from the outside, and to be creative with what you have all around you. Cage enrichment should be provided indoors as well as outdoors. Change or rotate the items daily. Drastically reduces boredom.

Enrichment foods: Feed them live food items when possible:

- Feeder mice/mealworms/crickets/smelt/whole eggs with shell/cockerels/snakes/chicken with bone
- Letting them forage for their food – hide it in their cage
- Hang food from branches or side of cage

Slide 43: Let them play

- Give them tunnels to hide in
- Provide a bowl of dirt
- Utilize their senses - touch & smell

Slide 44: More enrichment ideas

Think of items you can put in their cage that will stimulate smell, taste, sounds, touch and sight. Things they can chew on, carry around, dig in, etc. Introduce natural elements from the yard or woods.

- Corn husks, pieces of bark, leaves, rocks, tree branches with moss, lichen or leaves, bamboo, pine cones, grass, sunflower seeds, snake skin, coconut shells, sea shells, turtle shells, flowers, sand, feathers, deer antlers, moss, grass, stumps, hollow logs, Items from around the house:
- Cinnamon sticks, paper towel and toilet paper tubes filled with treats, tennis ball, cat toys, rope, hammocks, hang a fleece hat

Slide 45: Exercise wheels

Slide 46: Taking them out into the fresh air and sunshine to explore

Slide 47: Recordkeeping

It's always important to keep good records. Intake information, weights, treatment, medicines, appetite, stools, urination, etc. This information could be invaluable for the rehabber when transferring your opossum to another rehabber, taking your opossum to the vet, learning what works and what doesn't in treating illnesses and injuries, tracking their development, etc. Recordkeeping can and will alert the rehabber when there is a problem and your babies might be having nutrition issues/losing weight. If applying for a license, a record log of your animals may be required. Design a recordkeeping form that works for you. Keep it with the animals by attaching to the cage. As we rehab more and more animals, this information will be invaluable....

Slide 48: General sanitation

Always wash your hands before and after handling your opossums

Wash all food and water bowls with hot soap and water

Wear gloves when treating an injury or cleaning cages

Change out branches and nest boxes often

Change out and wash fleece in dye free, unscented, natural detergent

Do NOT bath your opossum unless they really need it....

Slide 49: Cleaning cages

- Chlorhexidine solution and water
- Simple Green is an easy and safe cleaner to use on cages

- White vinegar and water solution can also be used to spray down and clean cages and is safe for animals and the environment.
- Diluted bleach and water § Spray and scrub down cages with cleaner – hose off
- Leave out in the sunshine to dry

Slide 50: Being mindful: normal opossum behavior

- Sleeping all day
- Active at night
- Small bites that do not hurt/"tasting" your fingers
- Climbing on branches, sides and ceiling of cages
- Eyes that "pop" or bulge out of head
- Washing their hands and face
- Hissing or sneezing sound when small, clicking when older, low growl when upset
- Gaping when approached

Slide 51: Being mindful: abnormal opossum behavior

- Excessive shaking
- Loss of appetite
- Gagging or coughing/regurgitating
- Spinning or walking in circles
- Unable to stand upright, falling over
- Can't walk
- Dragging a limb
- Being aggressive towards other opossums

Slide 52: Preparing for release

- Should be acclimated to the outdoors for at least 3 weeks
- Should be at least 2.5 to 3 lbs.
- Minimize your contact with them. They should be gaping or freezing when you approach
- Feed and clean cages when they are sleeping
- Hide the food in their cage and let them find it. Feed whole prey foods
- They should be healthy and free of injuries
- Eyes should be clear, bright and alert
- They should be treated for fleas and parasites prior to release day
- They should be able to run, climb and grip easily and quickly
- Check for 3 or 4 days of good weather before releasing
- Location, location, location! Release location needs to be away from roads and close to a water source. Preferably a non-residential area away from humans/dogs/cars
- Can you release in the same site that they were found (this is ideal)?
- Feed them on the day of release
- Release at dusk or evening
- Throw some kibble around the release area and go back if possible periodically to leave food.
- When to abort the release. And try on another day

Slide 53: Misconceptions about opossums and why we rehab them

- They are NOT related to rats.
- They do NOT smell bad, they are very clean
- They do NOT attack humans
- They will NOT attack your pets
- They will NOT chew their way into your house or shed
- We all know, they will NOT give you rabies
- They are so misunderstood and often mistreated by humans.
 - We rehab them, because they need us! Millions are killed every year by cars, pets and other predators.
- Let's change how the public feels about them, one person at a time (start with your neighbors)

Slide 54: Saving one opossum won't change the world, but it will change the world for that one opossum!!

Slide 55: Things to think about

- Do I have the time to dedicate to the babies in my care?
- Will I make sure I don't take on more than I can handle?
- Will I get attached? Will I be able to release them when it's time?
- Is there someone I can reach out to for help/guidance?

Slide 56: The reason opossums have survived 75 million years is because God made them perfect!!