

# Feeding North American Box Turtles

by

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North American Box Turtles (*Terrapene* species) are omnivorous in the wild, eating a wide array of animals (vertebrates and invertebrates), plants (primarily but not exclusively fruiting bodies), and fungi (some species of mushrooms or toadstools). Perhaps due to their opportunistic dietary habits, captive box turtles are usually willing to eat a variety of food stuff. However, we sometimes mistakenly interpret a willingness to eat something as an indicator of high nutritional value. In my experience, box turtles eat food based on its visual, olfactory, and taste appeal. This works to the turtle's advantage in the wild



where food resources are spatially and seasonably varied, and their appeal and accessibility ensure that the animal meets its nutritional needs. However, in a captive setting, offering food based strictly on its appeal to a turtle may result in nutritional deficiencies. We need to offer a balanced diet that is not only appetizing but nutritious and in the right amount to sustain long-term good health, normal growth in juveniles, weight maintenance in adults, and results in [normal beak wear](#).

If your turtle has an overgrown beak, have it trimmed by a qualified veterinarian *who routinely sees chelonians as part of his or her practice*. An overgrown beak can interfere with eating; it isn't just cosmetic. Diet alone will not reshape a badly overgrown beak,

nor will the addition of cuttlebone to the menu. Cuttlebone is a good source of *supplemental* calcium to the diet, but contrary to popular belief, does not substantially contribute to grinding down or maintaining good beak length and shape.

Animals that are ill, injured, have a heavy load of gut parasites, or are nearing oviposition (generally the last few weeks to a month before laying eggs) may show a decline in eating. Animals with gut parasites may also eat well and yet remain chronically underweight. Check with your veterinarian if you suspect a health problem.

If your turtle is a poor eater but otherwise seems healthy, there could be things besides the food itself that are negatively affecting the animal's appetite or willingness to eat. These things include basically everything else impacting the turtle's world - habitat enrichment, substrate material and moisture level, microclimate, photoperiod and lighting, interactions with other animals, amount of people activity and noise/vibration in the area, and how much the turtle is handled. The list is long and beyond the scope of this article. For specific questions, please contact the author at [boxturtlefacts.org](http://boxturtlefacts.org).

## Too much of a good thing

On the other end of the spectrum from the fussy eater is the box turtle that will eat anything put in front of it. While it may be tempting to feed a "good eater" extra large meals, be careful about allowing your

turtle to eat to the point it becomes obese, appears to be “stuffed” into its shell, and can no longer close up its shell. Not only will your tubby turtle be more vulnerable outdoors if it cannot box up, but the animal will likely suffer internally from health problems.



Good weight



Severely underweight



Overweight

The [Donoghue Ratio](#) gives the target weight for many species of turtles and tortoises.

### Should I wean a turtle off his old diet slowly while introducing the new diet?

From my experience, the answer is, “No.” I have cared for hundreds of box turtles over many years – mostly wild-caught animals that are sick, injured, or part of a program to head-start and later release juveniles into the wild. A small number have been unwanted pets. I have rarely known what specific foods they were eating before I received them. I have just offered them the diet outlined below and they have usually begun eating it within a few meals if not right away. I have never noticed any sort of gastrointestinal distress associated with this abrupt diet change.

### DIET PLAN

The following diet is easy and quick to prepare using readily available ingredients that have been time- and taste-tested on hundreds of box turtles (including Eastern, Three-toed, and Western Box Turtles) from young juveniles to adults, including gravid females. Although an amount is stated for each ingredient, it’s approximate, just so you have an idea of the relative amount of each item to serve. Measure once, and then do it “by feel.” Some turtles clean their plate at every meal; others nibble at one meal and eat heavily at the next. It’s variable. *You may need to increase the total size of the meal if your turtle is especially active.*

### INGREDIENTS

#### 1. Commercial Pelletized Chow (~1 TBSP per turtle – select one or combine)

- [Top Choice](#)
  - [Omega One Adult Turtle Sticks](#) (first three ingredients: whole salmon, whole herring, halibut; crude protein min 37%, crude fat 9%) – available online and in some pet stores, including Petco but not Petsmart ; this chow is expensive but can be purchased online in large amounts for considerably less than in brick and mortar stores
    - A [juvenile formulation](#) is also available with higher protein content and smaller ball size

- Good Quality
  - [Nasco Frog Brittle](#) (first three ingredients: fish meal, meat meal, soybean meal; crude protein min 44%, crude fat 6%) — not sold in stores; it is available under the new name, “Frog Brittle,” from the manufacturer or under the original name, “Turtle Brittle,” from the [New York Turtle & Tortoise Society](#).
  - [Mazuri Aquatic Turtle Diet](#) (first three ingredients: menhaden fish meal, ground corn, dehulled soybean meal; crude protein min 40%, crude fat min 10%) — some box turtles eat this chow well while many do not, so if you buy it, try a small container first — available online and in some pet stores

*Note: There are many pelletized chows and canned diets on the market designed for aquatic turtles as well as a few purportedly designed specifically for box turtles. Some are of dubious nutritional value. I recommend you stick to the ones listed above, splurging for the top choice chow (Omega One) if possible. For a review of commercial aquatic turtle diets, see [theturtleroom.com](http://theturtleroom.com).*

## 2. Vegetable (select one or combine and vary over time; use ~ 1/2 TBSP per turtle)

- Acorn Squash
- Butternut Squash (Best choice)
- Carrots (use infrequently)
- Pumpkin
- Sweet Potato
- Yellow Squash
- Zucchini Squash (use infrequently; beta carotene level is low)

## 3. Leafy Greens (select one or combine; use ~ 2 square inches per turtle)

- Spring/ Herb/Baby Lettuce Mix (select low or no spinach, no chard content)
- Red-headed Lettuce
- Endive (Curly not Belgian)
- Dandelions (nutritious but some turtles don't like them)

## 4. Apple (about 1 tsp per turtle) – used as flavoring; almost all box turtles love it

## 5. Fruit/Berry Topping (select one or combine and vary over time; serve a big “crouton’s worth” per turtle)

- apricots
- berries (e.g., blackberries, blueberries, gooseberries, serviceberries, raspberries, only occasionally strawberries)
- cantaloupe
- mango (save money: buy frozen chunked mango and thaw before serving)
- Opuntia (cactus) fruit
- papaya
- peaches
- pears
- persimmons
- quiwi

## 6. Supplements (You will need BOTH products)

- *Rep-Cal* Rep-Cal Herptivite Multivitamins **AND** Rep-Cal Calcium

*Note – Many companies make a calcium supplement with Vit D<sub>3</sub> and a version without Vit D<sub>3</sub>. If your turtles live indoors, they need the version with Vit D<sub>3</sub>. This vitamin is essential to calcium metabolism. If your turtles live outdoors, you do not need the Vit D<sub>3</sub> additive, although it won't hurt, since the turtles will produce it by exposure to natural sunlight.*

## DIET PREPARATION



*Using a food processor makes preparation of the vegetable and greens portion of the diet a snap and creates tiny food particles that discourage turtles from picking out only the morsels they like best. Everything sticks together!!*

### Steps to Preparing Diet

1. Mix about 3 parts dry chow with 1 parts tap water. Cover and let sit 10-15 minutes; use FLAT container so all chow is in contact with water. The end result should be soft and fluffy, NOT mushy.
2. Cut up vegetables into crouton-size chunks after removing skin (leave skin on carrots).
3. Microwave vegetables in closed container until **slightly soft** (30-90 sec depending on amount on type of vegetable selected) – you don't want it either hard or mushy.
4. Dice vegetables into **tiny bite-size pieces** (or save time and pulse grind in food processor).
5. Dice greens and apple into parsley-flake size pieces (or save time and pulse grind in food processor).
6. Combine #4 and #5 together.
7. Combine **by hand** #1 (pre-moistened chow) with #6 (vegetable mix). DO NOT USE FOOD PROCESSOR. Turtles often reject really mushy, pureed food!!!
8. Add fruit topping. (Don't grind it up, serve in chunks or whole on top of meal – it's much more appealing!)
9. Lightly dust the meal with a supplement – alternate between vitamin and calcium supplement at each meal (i.e., first meal vitamin, next meal calcium, next meal vitamin, etc.). Note – a little is good, a lot is *not!* Use a tea strainer, lightly tapped, to sprinkle the supplement onto the diet, as if you were adding a little powdered sugar to a cupcake.

### Common Mistakes in Diet Preparation

- ✓ Chow is not properly hydrated. All water should be absorbed but the chow shouldn't be mushy; if you have water left over, you added too much water; never decant off water; it only sends nutrients down the drain.
- ✓ Chow is served dry straight out of the container. *Never serve chow dry* – it can get stuck in the incomplete upper palate, cause GI track impactions and hinder establishment of a positive water balance. (In the wild, box turtles naturally eat a diet with high water content; dry chow is too dry!)

- ✓ Greens are not chopped up finely enough. Box turtles sometimes love greens, but many don't eat them readily; finely chopped up greens are most successfully consumed if they are well diced and stick to something more appetizing.
- ✓ The meal is pureed into mush. Look at the picture of the turtle eating the diet at the beginning of this article. The diet is diced up into bite-size pieces. Aim for this in preparing the diet to make it appealing and prevent picky eaters from targeting only certain foods.
- ✓ Excess diet is stored improperly. You can store the vegetable/leafy green topping (Ingredients #2-4) up to 48 hrs. in an airtight container in the fridge; DO NOT FREEZE; it will turn into unappetizing mush. Hydrate the chow just before serving; do the same for the fruit topping to maximize freshness and appeal.

### Feeding Tips for Indoor and Outdoor Turtles

- ✓ Serve the meal at room-temperature. Chilled food cools down the core body temperature of a turtle and slows its metabolism; the turtle has to warm back up to digest its meal!
- ✓ Mist the habitat before feeding. Box turtles often become active shortly after it rains. If you animals seem sluggish and uninterested in eating, try misting their enclosure just before feeding.
- ✓ Feed first, clean later. Cleaning a habitat or otherwise fussing with things just before or during mealtime can leave a turtle feeling nervous and suppress its appetite.
- ✓ Feed turtles in the habitat where they live. Some turtles won't mind being placed in a separate feeding container. But many turtles are far too nervous to eat in a novel environment, or eat just after having been handled (other than to place them in front of their meal).
- ✓ Feed turtles in a safe place. Some turtles don't mind eating out in the open, but many eat far better if fed under a plant (fake or real) that makes them feel less visible to potential predators and pen mates. This is particularly true of small juveniles that have many predators as wild animals and like to keep hidden. Remember, your turtle is a wild animal; it just lives in captivity.
- ✓ Feed turtles on a surface that is easy to eat from. Don't make eating hard! A flat or very low sided dish like a butter tub lid or plastic sandwich box lid works well (see picture at the beginning of this article). Commercially sold feeding dishes invariably have sides too high for short-legged turtle to access easily. Use a dish that can either be thoroughly washed before reuse (I don't recommend rocks or wood for this reason). Or use a disposable paper plate. Some turtles eat white paper plates!
- ✓ Feed each turtle separately (especially males!). Some turtles will eat well alongside other pen mates of comparable size, but many won't. They either get aggressive or cower and walk away without eating their fill. It has nothing to do with the amount of food available. Turtles will walk right over a dish of food to steal food from another turtle.

### Special Feeding Tips for Outdoor Turtles

- ✓ Be prepared to adjust the feeding schedule to take into account the weather. There is no point in feeding outdoor turtles if a cold front is moving through or it's pouring. Feed as soon as the weather breaks. This is what turtles do in the wild. They eat when it's warm (not super hot) and don't eat when it's cold. If it gets cool at night, feed mid-morning just after it starts to warm up.
- ✓ Consider wetting the area just before feeding to encourage eating. Turtles may show a decline in eating if it gets exceptionally hot and dry.
- ✓ Don't worry about tapering off the frequency of feeding before hibernation. Turtles know when to stop eating and will naturally show a diminished appetite as fall progresses and temperatures drop. They should resume eating within a couple of weeks of emerging from hibernation in the

spring if the weather “cooperates.” Some springs are exceptionally cool and variable in temperature and your turtles’ appetite may be suppressed. It’s natural.

### **How often should I feed my box turtle?**

I feed turtles every two days. I think that when turtles are fed daily, they are more likely to be picky, and big eaters are likely to become overweight. Some folks feed every third day. As long as your turtle maintains good weight and health, this isn’t a problem.

*Do not depend on your turtles to meet their needs by free-scavenging in your yard and receiving only supplemental prepared meals. They may not die, but they probably won’t be healthy and live a normal life span. In the wild, box turtles range over acres of land to meet all their needs.*

### **How long should I give my turtles to eat before removing the food?**

When I feed turtles, I put a separate food dish in front of each animal. Undisturbed, a box turtle usually eats a meal in a few minutes. You should see your turtle eating so you can assess its appetite, and know that it has fair access to a meal (i.e. that another turtle or some other creature – pest or pet – is not eating it).

Although I would assume box turtles can handle a higher level of bacterial contamination in their food than humans (after all, they eat carrion – dead animal – in the wild), I don’t know what their upper tolerance is. I would not leave the food with them for many hours since it will dry up or spoil (depending on the weather) and encourage ants, rodents, and other unwanted visitors to move in. Never leave food in the habitat overnight. It will only encourage unwanted animals to pilfer the left-overs.

### **Should I offer cuttlebone to my turtle?**

Cuttlebone is a hard internal structure found in cuttlefish, a marine invertebrate. It is composed primarily of aragonite, a crystal form of calcium carbonate. It is a good supplementary form of calcium for turtles. But you will still need to dust your diet with a calcium supplement. And if your turtle lives indoors, the calcium must be Vitamin D<sub>3</sub> fortified. In my experience, adult box turtles rarely show any interest in cuttlebones but most young juveniles relish them. Most hobbyists recommend removing the hard backing before offering it to their turtle. It can be accomplished relatively easily if the cuttlebone is first soaked for a few hours in tap water, and then the backing cut away with a knife or single-edge razor blade.



*Most juvenile box turtles as well as some adults eagerly eat cuttlebone, an excellent source of supplemental calcium. Turtles kept indoors away from natural sunlight should also receive Vit D3 fortified calcium powder on their diet several times a week to assist in calcium metabolism.*





### Should I feed insects and other invertebrates to my turtle?

Every few meals, or as often as you can afford to do it, feed live garden earthworms or Canadian Nightcrawlers (commonly sold at many Wal-Mart outlets but also available in bait/hunting stores). These are highly nutritious, calcium rich food “packets.”

Earthworms are quite different from mealworms, supermealies, and waxworms. The latter three invertebrates are insect larvae, not true worms. (Mealworms and supermealies become beetles; waxworms become moths). Unlike earthworms, which are annelids, nearly all insects have low calcium content and an inverse calcium to phosphorus ratio. In small amounts they are fine to offer as treats – most box turtles love them – but a steady diet will interfere with calcium absorption and cause calcium to be removed from a turtle’s bones, possibly leading to [Metabolic Bone Disease](#). This can happen especially quickly in young growing turtles with high calcium requirements. If you feed commercially raised insects (e.g., mealworms, supermealies, waxworms, house crickets) dust them with calcium powder (Rep-Cal, ZooMed) immediately before serving. The calcium should have Vit D3 additive if your turtles live indoors.



*Most box turtles savor earthworms. They are a real bonus to a diet, unlike mealworms which can cause Metabolic Bone Disease if eaten in excess.*

Pillbugs (also known as sowbugs, roly pollies, woodlice) are terrestrial isopods; they are *not insects*. They are nutritious, calcium-rich, and a welcomed addition to your turtle’s diet. Pillbugs are easily [cultured](#) in a small container, and supported in outdoor habitats (including your turtle’s living space) if you have moist conditions and rich organic substrate. Young pillbugs are quite tiny; the perfect size for hatchling box turtles.

No more than once a month, it is okay to offer a pre-killed fuzzy-stage mouse or rat pup (“pinkie-stage” is not recommended since the calcium content is low). It is best if the rodent has been frozen in a freezer bag (to prevent desiccation) for at least 72 hours to kill any gut parasites and then thawed quickly in tepid water before being fed out. Never use a microwave to thaw rodents. It can result in dangerously

high internal temperatures. Rodents frozen more than 3 months or with freezer burn should be discarded.



*Box turtles eating pre-killed, frozen and thawed fuzzy stage mouse pups.*

### **Foods to Avoid or Limit**

- ✓ Do not feed cat food, dog food, hamburger, cold cuts, fried anything. Turtles can develop gout from the excess protein, soft tissue mineralization from excesses of calcium and vitamin D3, and fatty liver syndrome – a life-threatening condition – from the intake of excessive fat. Cat food is designed to maintain the urinary health of a cat by acidifying its urine and preventing calcium deposits from forming and blocking the urinary track. When fed to turtles, cat food can demineralize the bones resulting in severe deformity in growing turtles and other health issues in both juveniles and adults.
  - Caveat – I occasionally feed *small amounts* of plain boiled or broiled chicken, skin removed, to sick or injured box turtles. Animals fighting infections and mending from injuries benefit from an increase in the protein and fat level in their diet. In my experience and that of other successful turtle rehabilitators, a thimble worth of chicken consumed by an adult box turtle causes no problem and often encourages an animal with little appetite to chow down. I add this tiny amount of chicken to the diet for a few weeks but that's it. I warm the meat slightly (brings out the aroma), mince it finely and mix it in well with the meal. The goal is not to satiate the turtle on chicken, but to add this relished flavor/aroma to the diet. That said, chicken is also a great way to deliver oral medication to box turtles if you do not have the means or experience to tube the drug directly into the animal's stomach using a ball-tip syringe.
- ✓ Avocados – they contain persin, a chemical toxic to birds and likely reptiles too.
- ✓ Bananas – most box turtles LOVE bananas, and an occasional bite-size treat will do no harm. (For many box turtles, they make the perfect food in which to hide medication because bananas are so irresistible!) But they are high in sugar, high in potassium, and have high levels of phosphorus which can inhibit calcium absorption. Also, they are filling, and if served in quantity, can discourage a turtle from eating other more nutritious parts of a meal.
- ✓ Watermelon – it won't hurt to feed this now and again, but it has a fairly high water content (filling) and lower nutritional value than other fruits/berries included in my recommended diet

- ✓ Citrus fruit (*lemons, oranges, limes, and kiwi fruit*) – these fruits contain citric acids which can irritate the stomachs of reptiles, resulting in stomach upsets, vomiting and diarrhea. *Tomatoes are also acidic, so serve only occasionally.*
- ✓ Cruciferous vegetables (cabbage, kale, Brussel sprouts, and broccoli)– this group of vegetables is high in goitrogens. Goitrogens inhibit the absorption of iodine which over prolonged periods may lead to a condition known as hypothyroidism (underactive thyroid). Symptoms of hypothyroidism include lethargy, bloatedness, slow growth, and can eventually prove fatal.
- ✓ Legumes (beans, peas)–Most are high in purines, which can cause gout when eaten in excess. Best just to avoid them.
- ✓ Mealworms, Mightie Mealies, Waxworms–See discussion in previous section.

### **I've decided to overwinter my turtle indoors. Do I need to feed him?**

Yes, and with the same frequency and in the same amounts as in summer! But to succeed, the turtle must be kept in mid-summer-like conditions (in terms of temperature, humidity, and diurnal cycle) in a properly enriched [indoor enclosure](#). I do not recommend that you attempt to hibernate (technically “brumate”) your turtles indoors. It requires special preparation to clear the animal’s gut of all food, and a special climate and humidity controlled chamber to be done safely. If you simply put your turtle in a cool room or garage, your turtle cmay die and at the very least is unlikely to come through unscathed. The animal may be too cold to move around and appear to be in a state of dormancy. But in fact the turtle is unable to go through all the physiological processes associated with entering and staying in a true state of brumation and is really just spiraling downhill in terms of its nutritional status, water balance, and overall health.

### **Feeding Hatchlings**

Indoors, box turtles start to eat a few weeks after hatching, or if there is an unresorbed external yolk sack, a few weeks after it has been fully resorped. Outdoors or in the wild, box turtle generally hatch in the fall, and may or may not eat before entering winter hibernation. Some young found in the spring still have an egg tooth and small retained yolk sack, suggesting they either recently hatched or hatched just before entering hibernation and spent the winter in the natal nest.



*Hatchling Eastern Box Turtle with nearly fully resorbed yolk sac at center of plastron.*

*If a box turtle hatches with a retained yolk sack it should be isolated by itself in a supportive environment until the yolk is fully resorbed. A plastic lidded container with a few tiny air holes works well. Nestle the turtle in very wet paper toweling changed daily. Keep the container out of direct light at moderate room temperature (72-75° F is fine).*



*While some hatchling box turtles can be feed communally (these young are feasting on diced earthworms), often there is some level of fighting and bullying at mealtime. To insure good growth, only keep same size young together, and feed animals at separate feeding stations with plants and other visual barriers between pen mates.*

*Shy box turtles may require some coaxing with small invertebrates placed in front of them or offered by forceps wiggled slightly to make the food “move.”*



Hatchlings and young juveniles show a shift towards a calorie-dense diet rich in animal protein – small stomachs can only eat small meals and need it to be energy packed! At least in captivity, they rarely show much if any interest in vegetables in the first month or two after hatching although many will eagerly eat commercial hatchling pelletized chows (which contain some plant matter).



*Small juvenile Eastern Box Turtle eating chow with fruit and vegetable topping dusted with calcium supplement. A pill cap works well as a dish for a single turtle. For groups, plastic food container lids work well.*



*For a very shy turtle, putting a leaf over it at meal time, or feeding the turtle under a plant sprig can keep the turtle feeling safe and willing to eat.*

### **General feeding plan for juveniles:**

- ✓ Start hatchlings on minced earthworms (from yard or store-bought) along with other available small *wild* invertebrates (e.g., tiny millipedes, spiderlings, black field crickets, grasshoppers, tiny preying mantids, pillbugs). *Avoid feeding mealworms due to their low calcium content and inverse calcium to phosphorus ratio. If you feed any insects, be sure to dust them in calcium powder.*
  - Pill bugs (not an insect but a crustacean that is calcium rich) are a great food for hatchlings as well as for adults, and can easily be [cultured](#).
- ✓ Around the second month, if not earlier, I introduce hydrated Omega One or Zoo Med hatchling/juvenile formulation (some hatchlings will eat it from the get-go, which is fine). Initially I sometimes mix the chow with diced earthworms to make it more appealing.
- ✓ Around the third month, I start serving the chow with the vegetable and fruit topping (always dusted with vitamin or mineral supplement); some juveniles ignore the topping, others eat it right away.
- ✓ Around the sixth month (or sooner depending on the size of the young), I switch to the adult formulation of the pelletized chow.
- ✓ I continue to offer earthworms and other wild invertebrates every few days until the young are at least a year old. The supplemental invertebrates are not essential, but are much relished.
- ✓ I always make sure that growing box turtles have ad lib access to cuttlebone to boost their calcium intake.
- ✓ Keep your hatchlings hydrated!! For at least the first few months, I keep the substrate (sphagnum moss) very wet – truly swamp like. I don't use a water dish. But if in doubt provide water! Just

keep in mind that neonates can drown easily, and the depth of the water must be so shallow – a fraction of an inch – it will dry up quickly and need replenishment often. Once the turtles are a few months old, I provide a water dish and cut back slightly on the swamp. The dish can be any very shallow and low sided container, like a party-favor size (~ 3 inch-diameter) Frisbee or short-sided food lid. For specific questions, please contact the author at [boxturtlefacts.org](http://boxturtlefacts.org).