



# Milwood Animal Clinic

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## Tortoise Care

### Minimum Requirements:

- Appropriately sized, safe habitat
- Appropriate substrate
- UVB mercury vapor bulb
- Water dish for drinking and soaking
- Tortoise pellets
- Good quality hay
- Vitamin supplement powder
- Calcium supplement powder



### Captive Housing

There are many choices, from the simple to the very elaborate. The following is a review of some of the more common cages:

**Rubbermaid storage containers:** These make inexpensive indoor pens for small tortoises. They are light and easy to clean. They are opaque so the animal can't see out. The 50 gallon container is an ideal starting point for one tortoise. Keep in mind that bigger is better.

**Reptariums:** The 100 gallon and larger Reptariums make great pens for small tortoises because they have great ventilation. You can also purchase a plastic liner that allows you to use a variety of substrates.

**Tortoise Table:** This is a popular choice for small tortoises, tortoise tables can be purchased or made DIY. There are many resources for both options online.

**Outdoor pens:** During warmer months, an outdoor pen can be a great way to keep your tortoise. The tortoise gets the benefit of sunshine (for the synthesis of Vit D3) and exercise. A pen can also be planted with a variety of edible weeds and plants. It is very important to keep in mind that tortoises can be escape artists. When building a pen a barrier must be dug around the perimeter at least 8" deep...deeper if the soil is easy to dig. They can also climb. The pen should be a foot or more high with an in facing lip. Pay special attention to corners. Also of concern are predators; raccoons are particularly notorious for getting into pens and eating turtles. You **MUST** have a tamper proof top for your enclosure. It is recommended to bring your tortoise inside at night, as even the best outdoor pens can be destroyed by a hungry predator!

It is also important to provide a warm dry retreat. This can be accomplished by using a Rubbermaid deck box and mounting a ceramic heat emitter in the lid (hooked up to a thermostat) with a hole cut in the side. Instructions on this type of pen can be found at

[www.russiantortoise.net](http://www.russiantortoise.net)

## **Substrate**

Finding the best substrate for your tortoise can be difficult, and may be a matter of preference. Options include: Coconut fiber (e.g. Eco Earth), reptile carpet, newspaper, or hay. Each option comes with good and bad qualities.



Reptile carpet is relatively absorbent and easy to clean but does not allow burrowing. You will want to invest in at least 2 carpets, so you can replace each as it becomes soiled. There are higher and lower qualities of carpeting. Do not get a low quality carpet, as the fibers will become frayed, causing nails to get caught and enticing your tortoise to eat the edges.

Newspaper is absorbent and easy to clean. The downside is that your tortoise won't be able to burrow. Hay is inexpensive and allows burrowing but is not very absorbent and will need to be changed out frequently. Coconut fiber is easy to clean and absorbent and allows burrowing. It should be changed regularly. Do NOT use wood shavings such as pine or cedar, as they give off hydrocarbons that irritate the respiratory tract. Do NOT use sand or crushed walnut as they can be ingested and cause intestinal obstruction.

## **Temperature and Humidity**

Providing a proper temperature gradient is critical for a healthy tortoise. One end of the enclosure should have a UV basking bulb that provides a hot spot (basking temperature) in the low 90° range. On the opposite end of the enclosure temperatures should be in the low 70s. At night the temperatures should be in the low 70s. It is important for growing tortoises to have a night time temperature drop to help prevent pyramiding of the shell. If additional heat support is needed, an under-tank heater can provide this. Use an under-tank heater made for reptile enclosures. Do not stick the heater to the cage but instead lay it out under the cage. This will help prevent hot spots that could burn your pet. Raise the base of the enclosure slightly around the heater's electrical cord with pencils or shims to prevent it from pinching the cord.

Alternatives to under-tank heaters include heat bulbs and ceramic heat emitters. These can be used but be aware that they can get very hot and pose a fire or burn hazard.

Humidity is an important consideration with tortoises. It is also very misunderstood. There are those that claim that high humidity will cause shell rot and respiratory infection. This is only partially true. High humidity, damp substrate AND cool temperatures cause problems. In the wild they live in fairly arid conditions although some report that they are often found near streams and small lakes. They cope with low humidity by digging long burrows where the humidity is as high as 70%. In the typical indoor pen, with basking lights, air conditioning and dry substrates, humidity is often extremely low. Dehydration is a very real risk. Providing a damp retreat at one end of the habitat will help prevent dehydration. This can be accomplished by placing sphagnum moss under a hide box and spraying it daily with water to keep it damp. Change the moss weekly to prevent mold or bacterial overgrowth.

Tortoises also benefit from daily soaks in chin deep, lukewarm water to help support proper hydration.

## **Lighting**

UVB light, which tortoises usually get from the sun, is essential for them to survive. They use the light to properly digest their food and utilize calcium. You will need to use a UVB light during the daylight hours (about 12 hours) for your tortoise. This will help to simulate a natural

environment. The light should be positioned over the basking area and produce heat as well as UVB light. The basking temperature should be in the low 90° range. There are several full spectrum fluorescent light bulbs on the market. Most claim that they duplicate the sun's light spectrum, however it is unlikely that any can achieve the intensity of ultraviolet light emitted by the sun. Some bulbs provide so little UV light that they are nearly useless, and some are so powerful that can burn the reptile. **We recommend ReptileUV MEGA RAY or Zoo Med Power Sun mercury vapor bulbs for your tortoise.** Mercury Vapor bulbs have the advantage of providing both UV light and heat, often reducing the number of heating elements necessary. The Mega Ray bulb must be ordered online. Visit [www.reptileUV.com](http://www.reptileUV.com) to purchase and learn about their bulbs. The Zoo Med Power Sun can be found at local pet stores. Your UV lights must be changed every 6 months in order to provide the highest quality artificial UV light possible. Using an appliance timer to turn your lights off and on is very helpful in regulating your light cycles. Be aware that mercury vapor bulbs also get very hot and can pose a fire or burn hazard. Your tortoise should also be exposed to natural, unfiltered sunlight as often as possible. Always supervise your pet while it is outside to prevent injuries from predators, overheating, or escape.



## Diet

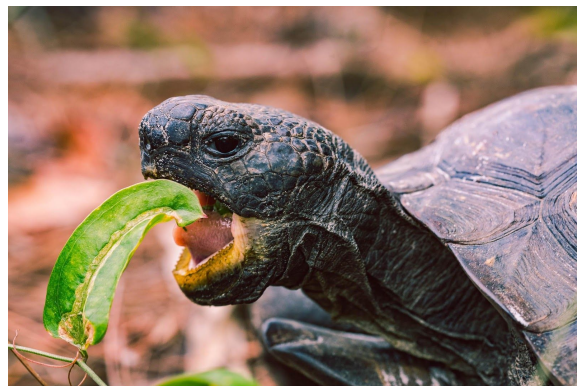
Tortoises thrive on a high fiber, high calcium, low protein diet. This will ensure healthy growth levels and a well functioning digestive system. Commercial pellets should comprise up to 80% of the diet. We recommend Zoo Med Natural Grassland Tortoise food. Hay should comprise the remainder of your tortoise's diet. Timothy, Orchard Grass, Fescue and Bermuda Grass hays are good choices. Be sure to purchase good quality hay from a reputable source. Avoid hay with a lot of stems or stalks as well as stale or moldy hay. Hay should be chopped up into small pieces with scissors or a food processor to avoid GI obstruction and to facilitate eating.

Veggies should be considered a treat and should only be a small percentage of the total dietary intake. Avoid fruit entirely or at least very sparingly, as the high sugar content can cause diarrhea. Tortoises have an extreme sweet tooth and will often refuse nutritious food if they are offered fruit.

If your tortoise has never eaten pellets or hay before, it may take a while to get him or her to accept it. While switching to a proper diet, slowly decrease the old diet over time to allow your pet to adjust to the new diet. Try soaking the pellets in water and adding them to the familiar food. Try spraying the hay with water and mixing it in your pet's old diet.

The following greens are acceptable treats to feed to tortoises:

- Arugula
- Basil
- Cilantro
- Clover (no pesticides or herbicides)
- Dill leaves
- Endive\*
- Escarole
- Mint
- Peppermint leaves
- Radicchio
- Raspberry leaves
- Red or Green Leaf Lettuce
- Romaine lettuce (no iceberg or light colored leaf lettuce)\*

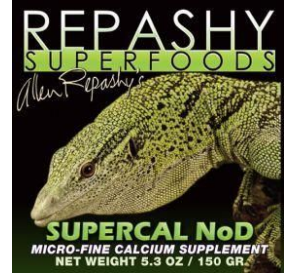


Watercress\*  
Wheat grass

\* Contains high amounts of Vitamin A, which is good for eye and respiratory health.

## Supplements

In addition to this nutritious diet, your tortoise will need vitamin and mineral supplementation. A pinch of calcium powder should be sprinkled on the food daily. We recommend Rep-Cal or Repashy SuperCal. For vitamin supplementation we recommend Repashy Supervite sprinkled on the food twice a month.



## Water

The water dish in the habitat should be large enough to allow the tortoise to soak in it if it wishes - it must also be shallow enough to protect from drowning. While this species would seldom encounter standing water in the wild, our inability to properly duplicate the climate that they are adapted to makes provision of a water source a safety net against dehydration. As mentioned above, tortoises benefit from daily water soaks. Place the tortoise in a container (such as a clean litter pan or large Tupperware container) with enough clean water to just reach the chin for about 10 minutes daily to allow it to drink and eliminate. It is a misconception that tortoises naturally acquire almost all of their fluid requirements from their food and therefore they do not require additional drinking water. Most tortoises are indeed adapted to a semi-arid environment but depriving the tortoise of water can result in dehydration. During a rain wild tortoises will often drink and urinate simultaneously. This behavior can sometimes be stimulated in hot weather by spraying the tortoise with a spray bottle.

## Hibernation

As more studies have been done, we are finding that hibernation is not necessary for tortoises and can actually be detrimental to their health. Hibernation is a complicated and risky process for reptiles. The animal must be in excellent health and exact environmental factors must be provided. If you are interested in more information, please speak to one of our veterinarians.

## Health Problems

Tortoises are especially susceptible to respiratory ailments. Runny or bubbly nose, loss of appetite and gasping are symptoms of upper respiratory tract disease (URTD) or pneumonia. If you see symptoms such as these, contact your local reptile veterinarian, and separate your tortoise from any other pets.

Another common health problem in tortoises is intestinal parasites. It is quite common for a tortoise to have parasites straight from the breeder or pet store. Symptoms of parasites can be weight loss, lack of energy, mucous or blood in stools, foul smelling stools, or no symptoms at all. For this reason, it is recommended to have a veterinarian check your tortoise for intestinal parasites (using a fresh stool specimen) as soon as you bring your new pet home. As some parasites can be transmitted to humans, be sure to wash your hands well after handling your tortoise.



# Cleaning, Disinfecting and Sterilizing

How they are different and why you need to know

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## A Brief History of Antisepsis

The two perhaps most important contributions to antiseptic procedures in the medical arts both happened during the last 150 years. The French chemist and microbiologist Louis Pasteur set the stage for the later appearance of British surgeon John Lister (1827-1912) who pioneered antiseptic operating room procedures (and after whom Missouri physician Joseph Lawrence named his antibacterial mouthwash). In a time when surgeons operated in their street clothes, surrounded by similarly clothed (and septic) onlookers, and just after surgical instruments were finally being washed in soapy water between operations, Lister campaigned for heat or chemical sterilization (and for surgeons to use something other than sawdust swept up from the floors of the mills, used in surgical dressings). William Stewart Halsted (1852-1922) furthered the cause of antiseptic technique with his introduction of surgical gloves. [The word sepsis is a noun that relates to the presence of organic pathogens (disease-causing organisms) in the blood or tissue; "septic" is the adjective. "Antisepsis" is the noun meaning destruction of such organisms; "antiseptic" is the adjective.]

To many people, these three terms--cleaning, disinfecting and sterilizing--are synonymous but the fact is that they stand for three discrete processes. What you know--or don't know--can at best be a waste of time and money for you; at worst, it can make you ill and be deadly to your animals.

## Cleaning

Cleaning is the general removal of debris (food, feces, urates, blood, saliva and other body secretions) that helps reduce the amount of organic matter that contributes to the proliferation of bacteria and diseases. The more debris that is removed at the cleaning stage, the better able your disinfectant will be able to do its job. Most disinfectants cannot work their way under chunks of debris or smears of blood on the tank or utensils; if any bits remain stuck on, use a little elbow grease--or a putty knife dedicated to cage cleaning--to work it off. Before really getting into it with a scouring sponge or pad, test a small area of the tank to see if it is going to abrade the surface of the tank. Repeated scratching may be unsightly, but worse is the fact that it provides lots of nooks and crannies in which bacteria and other beasties can hide.

Cleaning is best done with hot, soapy water. The hot water and surfactants in the soap work to loosen debris stuck to surfaces. Clean rinse water flushes it away. When you are cleaning enclosures that cannot be taken to a tub, sink or outdoor hose to be thoroughly rinsed out, it must be done with sponges, rags or paper towels. In any case, you must completely rinse out or wipe off all soap residues as some ingredients may interfere with the work of the disinfectant.

A simple cleaning may involve the removal of animal waste and the substrate surrounding it. If the substrate is paper, the entire substrate should be changed. If the enclosure is lined with outdoor carpeting or artificial turf, it should be removed and a clean piece placed in the enclosure. (Rotating pieces allows enough time to thoroughly clean, disinfect and dry the soiled piece.) If the animal waste, food, or fluids from prey have come into contact with the floor or walls of the enclosure, then they should be disinfected after the areas have been cleaned.

Almost any good liquid soap can be used for cleaning. Simple Green™ and regular dishwashing soap both work well; be sure to dilute products such as Simple Green according to manufacturer's directions. There is no need to bother with soaps advertised as "antibacterial" - all soaps are antibacterial in that they, in conjunction with hot water, help remove bacteria from surfaces. Antibacterial soaps are not disinfectants and should not be used in place of a proper disinfectant. Do not use soaps or cleansers which are abrasive, contain pine scents or phenols.

### **Disinfecting and Chemical Sterilization**

Disinfecting means pretty much what it says - it removes most of the organisms present on the surface that can cause infection or disease. Disinfecting is not suitable for eradicating mites but is useful against a number of bacterial and viral microorganisms. Sterilization, on the other hand, is the killing or removal of all disease causing organisms. Often the same products may be used to disinfect and to sterilize; the difference is in the strength of the solution and/or the amount of time the solution is left in contact with the surface.

There are many products on the market that may safely be used (when directions for use are carefully followed) to disinfect reptile and amphibian tanks. Two may be found on your grocer's shelves - chlorine (household) bleach and ammonia. Both are highly toxic to you and your animals and must be used with extreme care. Other disinfectants may be purchased through animal supply catalogues, industrial supply houses and feed stores: Roccal-D™, a quaternary ammonia compound, and Nolvasan™ (chlorhexidine diacetate). The latter is useful to have in the herper's collection of supplies because in its dilute form it may be used to flush wounds, treat stomatitis (mouthrot) and soak syringes and feeding tubes. These products are expensive, ranging from \$35-55 but, when diluted according to manufacturer's directions (Nolvasan, for example, is used at the rate of 3 ounces per gallon of water) they will last a long time (depending upon the number of enclosures, furnishings and utensils). Bleach should be used at the rate of 4 ounces per gallon of water, ammonia at 3.5 ounces per gallon. Note that weaker solutions should be used on amphibian enclosures and furnishings.)

To disinfect surfaces, generously apply the solution to the surface with a saturated cloth, sponge or spray bottle, or let the object soak in a container of the solution. Let the solution sit for at least 10 minutes; 15-20 minutes is better. To sterilize, let the solution sit for at least one-half hour (be sure to check the manufacturer's directions to see if a stronger solution is necessary for sterilization). Rinse out thoroughly, especially when using bleach or ammonia. If there is any doubt about your ability to thoroughly rinse out an enclosure, or the enclosure is made of wood, you may wish to think twice about using bleach or ammonia. Any residual of these substances left in the tank can cause severe, if not fatal, problems for your animals. Both substances produce strong fumes that can cause internal and external irritations. (Simple Green's aroma is artificial sarsaparilla and is not toxic to reptiles; no information has been found in reference to its use in amphibian enclosures.)

### **Now Comes the Fun Part**

It doesn't make any sense to use disinfectants if you spread organic matter from one animal's enclosure to another on your sponge, rag, gloves or utensils. While your risk of cross-contamination is reduced in a long-established closed group of animals, any group that is subject to change, with new animals coming into the group (not necessarily into the same enclosures as established animals) then the risk of cross-infection is high.

## **Cleaning Equipment and Supplies**

A set of equipment and supplies should be dedicated to new animals. In large groups of established animals, the threat of cross-contamination can be reduced still further by dedicating a separate set of equipment and supplies to each type of animal: snakes, lizards, turtles and tortoises, amphibians.

The cleaning equipment and supplies required include:

- disposable gloves
- sponges
- scrapers (such as a putty knife)
- glass or metal bowls or buckets for hot soapy water and for the rinse water
- paper towels, sterilized cloth towels or rags, or disinfected sponges
- disposable trash receptacle such as a paper or plastic bag.

Items such as feeding and water bowls, rocks and ceramic, plastic or rock caves and hide boxes should be removed, cleaned and disinfected (as described below) and set aside; they can be placed back into the enclosure once the substrate and tank have been taken care of. Water bowls should be disinfected weekly in a bleach solution.

The disinfection and sterilization equipment and supplies required include:

- disposable gloves
- a spray bottle or bucket of prepared disinfectant solution
- a metal or glass or bucket of fresh rinse water and two for disinfectants.
- large receptacle for soaking and disinfecting furnishings (bowls, rocks, caves).

Utensils such as scrapers, rags, sponges, snake tongs or hooks, and reusable rubber gloves should be washed in soapy water, then soaked in one disinfectant (such as a chlorine solution) for at least five minutes. The utensils are then rinsed thoroughly before being used again. The second container of solution (such as Nolvasan) is used to disinfect the enclosures.

## **The Process**

Begin working with your established, healthy, animals. Once you have finished their enclosures, clean and disinfect your utensils. Move on to any established animals that are ill. Clean and disinfect the utensils before starting to work on the quarantined animals last. (The idea of having separate sets of utensils and spare rags and sponges begins to not sound so crazy, after all...) Clean and sterilize the utensils, sponges and rags after you are finished.

Needless to say, this can make cleaning a frustratingly time-consuming task if only one set of utensils is used. So splurge and buy a couple of inexpensive putty knives. Hit your local thrift shops for old towels and sheets to (rip into rags) and old mixing bowls. Sponges can be bought in packages of 8-10 to a pack. Save shampoo and similar bottles to store smaller quantities of your disinfectants so that you are not always working with the heavy gallon bottles. With all the waste and trash that gets dumped into our landfills, it is nice to know that there are ways that we can reuse and recycle.

Rags, towels, cloth bags and sponges may be sterilized by soaking in ammonia for 30 minutes in a well ventilated place away from the animals, then washing thoroughly in hot soapy water and

allowed to dry. Bleach may also be used for this purpose, but after a time it begins to destroy the integrity of the fabric. This isn't a major problem if you buy your towels and rags at thrift shops.

If at all possible, establish a routine. Check enclosures daily for messes that can be quickly cleaned. Schedule one day a week to do a complete cleaning of all enclosures. This is a good time for animals that are otherwise enclosure-bound to get some fresh air and sun, or a nice long soak in the tub while you slave away in their tanks. Crank up the music, plop a drop cloth on the floor if you tend to be a klutz like me, and go to it...it's a dirty job, but somebody's gotta do it.

### **Recipe for Glass And Window Cleaner**

Finding a window and glass cleaner that will clean the surfaces thoroughly without leaving streaks and smears often means using one with ammonia (which, by the way, is not good for Plexiglas). It has become harder to find products such as Windex™ made with vinegar.

Well, worry about streaks and fumes no more. Make your own window cleaner that can be used on glass (windows and enclosures), mirrors and poured into your car's windshield wiper's cleaning fluid container.

Into a clean, empty gallon bottle, pour:

1 quart rubbing alcohol

1/4 cup vinegar

Just a few drops of liquid soap

Fill up the rest of the bottle with clean water; distilled water is preferred but not essential. Shake well. The mixed cleaner can be poured into spray bottles, or directly (I would advise using a funnel) into your windshield wiper cleaning fluid container. Just spray it on and wipe as usual. For stubborn spots, spray some on the spots, let sit for a minute or so while you work