



Sulcata Tortoise

Sulcata tortoises are native to more northern parts of Africa, ranging from the southern edge of the Sahara down through the arid countries, including Senegal, Mauritania, Mali, Niger, Chad, the Sudan, and Ethiopia, up through the dry, hot Massaua coast bordering the Red Sea.

Captive bred and imported Sulcatas can be found increasingly found in the pet trade. The sulcata is the largest of the African mainland tortoise, with specimens easily reaching 24-30 inches (60-75 cm) in carapace length and 80-110 pounds (36-50 kg). The largest on record was a male resident of the Giza Zoological Gardens (Egypt) who weighed in at 232 lb (105.5 kg) and measured 41.6 inches (104 cm) over the carapace (Flower, 1925, in Stearns). The oldest recorded specimen in captivity, also at the Giza Zoological Gardens, was 54 years of age (Hughes, 1986, in Stearns).

Sulcatas have broad, flattened carapaces, evenly brownish or yellowish in color. As they age, the growth rings inches on each of the scutes are strongly marked. Mature males develop reverted marginal scales in the front. The gulars on the plastron (the marginal scales just under the neck) are deeply forked; the anal scutes are also deeply divided. The skin on the legs is well blended into the shell color. Well-defined spurs, which serve no observable function, are present on the back of the rear legs. Their skin is very thick which may serve to reduce fluid loss through transpiration.

Sulcatas come from some of the Sahel, the hottest, driest area in Africa. Some regions may not get rain for years. To make the most of available moisture, their skin is resistant to fluid loss but, when exposed to moisture, may become highly permeable. Towards this end, they will excavate pallets or burrows in the ground to get to areas with higher moisture levels; in the wild, they may spend the hottest part of the day in these microhabitats. Burrows may average 30 inches in depth; some dig tunnel systems extending 10 feet or more underground. Sulcatas are, like most turtles and tortoises native to dry areas, extremely efficient in their use of water. A sulcata may urinate just 0.64 ml a day, significantly less than their spur-thighed cousins living in the relatively lush Mediterranean countries who may urinate 1-2 ml a day. A danger, then, in captivity is that too much water may be given or made accessible which may lead to health problems including skin and shell infections and kidney problems.

In captivity, a similarly hot and dry environment must be provided year round. Unlike the California desert tortoises, the sulcatas do not hibernate. While they can tolerate some surprisingly low temperatures, they cannot be allowed to get both chilled and wet or kept outdoors in chill, damp weather.

Substrate: It is important for your tortoise to be able to burrow. In the wild, Sulcatas spend 85% of their time in scrapes and burrows. They maintain the proper humidity balance in their own created microclimates this way, and retain the necessary moisture to live. Make certain you have a good substrate in your enclosure. I currently use CareFresh® which you can obtain at the Bean Farm. You can also use 100% alfalfa pellets, timothy hay, aspen particles or Lizard Litter...find the one that works best for you. However, steer clear from straight sand, oyster shells, and especially pine or cedar shavings. The oils in those woods are toxic to your tortoise. You should put about two to four layers of newspaper on the bottom of the enclosure under any substrate. This way, any urine or water can soak through the substrate, not sit in it. It also makes for a quick clean-up and is safe for the reptile. A really good substrate for a Sulcata is a 50/50 mixture of sterile soil (topsoil) and soft sterile playground sand. It is also important to provide a hide box or area for your tortoise, as they feel most comfortable when surrounded on at least 3 sides by their environment. You must place the hide box in the "cool zone" of the enclosure and not near the heat sources. A hide box need not be anything more than a cardboard box with an appropriate sized

opening for the tortoise. I personally use a few pieces of newspaper, tented, on one side of the enclosure with one opening facing the enclosure and one opening facing a wall. My tortoise retains that shape for a day or two before completely shredding the tent in favor of a pile of newspaper particles which he then burrows into. I prefer the neater tent shape, but its the tortoise's house not mine. If the tortoise is happy, I'm happy! You might find your tortoise "hiding" a lot. This is normal so do not be alarmed. My tortoise spends a large part of his day in its hide area, frequently coming out to eat or walk, but always going back to the hide area. The Sulcata is an active tortoise during the day though and should be provided enough space in the enclosure for it to exercise and walk. My tortoise comes out for supervised romps in my kitchen every afternoon where it proceeds to do "laps" for at least an hour. Although, sometimes it just crawls head-first into a corner and "meditates". In the wild, they spend allot of time hiding, this is normal anti predator behavior for young animals.

Environment: These tortoises come from a desert region therefore require a dry, arid enclosure. A hide box is often beneficial. Many people use a Dogloo and put a pig blanket in the housing for warmth in large enclosures.

Feeding: Food is an important factor in healthy growth. It is crucial NOT to overfeed your tortoise. One feeding per day is plenty. $\frac{1}{4}$ cup for the first six month of hatchling stage (0-6 months of age) and then $\frac{1}{4}$ to $\frac{1}{2}$ cup of greens for a hatchling 6 months to 1 year of age is adequate. If you aren't sure, always use less. After one year, a juvenile should get no more than 1 cup of loosely packed greens per day. Adults, of course, get larger rations. If juveniles are overfed, or fed as much as they will eat, they can grow far too quickly, causing shell problems, bone problems, and mineral deficiencies. Slow, Steady, growth is the key. I use the flat lid of a Tupperware for feeding and easy cleaning. Make sure your tortoise can easily access its food bowl. The food bowl should be flat. If the food bowl is slightly elevated, it might help to sink it into the substrate slightly. If the tortoise has to climb or reach to get at its food, it might tip itself upside-down and not be able to right itself. If this happens and goes undiscovered, the tortoise can suffocate, or overheat and die. Make it a habit of checking on your hatchling tortoise periodically when you are home. With very small hatchlings, be cautious of what you put in the enclosure for furnishings or decorations. I didn't put any "pen furniture" in with my Sulcata until after he was at least 1 year old. The reasoning behind this is that when they are very small and light, simply climbing up on a rock or wood can cause them to tip themselves, whereas if everything is relatively flat, they have nothing in the enclosure with which to tip themselves. After the hatchling stage, you should decorate the environment to be stimulating, adding areas where they can hide, bask, rocks and wood to climb on or walk over or through. Keeping your tortoise interested in its environment will keep it happier and make it more enjoyable when you are watching.

Diet: The majority of the Sulcata's diet intake should be from a variety of grasses, weeds, and clovers. NEVER offer iceberg lettuce. A Sulcata tortoise has a high fiber requirement in the diet. To get a better idea of what I mean, think of the Sulcata as a cow, they are natural grazing animals. Approximately 75% of the diet should be comprised of graze such as the grasses, weeds, and clovers. The remaining 25% of the diet can from mixtures of dark, leafy greens such as turnip greens, mustard greens, collard greens, chicory, watercress, hibiscus leaves and blossoms, mulberry leaves, grape leaves, dandelion greens and blossoms (untreated with pesticides). If you feed kale and collard greens, only do so once in a while in small portions. Do not offer items such as chard, spinach, broccoli, cabbages, cauliflower, green beans or beans of any kind, corn, sprouts of any kind, tomatoes...or any legume or high protein vegetable. These tortoises are grazing animals in the wild, and a graze type of diet is the very best you can provide for them. If you do not have the yard space to grow graze at your home, you can use window boxes to grow it inside, and then clip from it for feedings. You can obtain a great pasture seed mix which is low in cost and specifically pre-mixed and formulated for grazing tortoises at this link . You can also get great untreated hibiscus plants from Pet Supreme. Pet Supreme also has other wonderful and naturally grown terrarium plants if you keep chameleons, or other vivarium reptiles. Do not offer fruits. In place of fruits as a treat, you can offer Opuntia cactus and berries. Opuntia cactus is also known as "Prickly Pear or Nopales". Opuntia cactus is high in fiber and contains nutrients needed for a healthy digestive tract. DO NOT just buy a cactus from your local garden store without first making sure it is untreated with pesticides and that is is, in fact, Opuntia. There are about 200 varieties of Opuntia, but they are all edible. Shake up the tortoise's diet and give a variety of foods that are acceptable to keep your tortoise interested in meals. Each tortoise is different and each tortoise has different food preferences, just like people!

Supplement: It is important to use supplements to maintain proper health. I use Tri-Cal 2:1 ratio phosphorous-free calcium supplement. I also use Nekton-Rep multi-vitamins. Rep-Cal calcium and Herptivite vitamins are also good choices and probably easier to find or order online. You should use 2 parts calcium supplement to 1 part vitamin supplement. You can mix up your own pre rationed calcium/vitamin mixture in a empty salt shaker if you want, to avoid having to open and sprinkle from two different containers all the time. Since you are using such a small amount, I just do one big sprinkle of calcium powder and one smaller sprinkle of vitamin powder. You should sprinkle the 2:1 ratio mixture on the food at least twice weekly for optimum vitamin supplementation. I supplement almost every single day, which works well also. If the supplements are too powdery on top of the food and the tortoise seems wary of eating, just spray with a little water to dissolve it into the greens. I use a regular plant mister filled with water, which I keep on hand near my enclosure.

Maintenance: The enclosure should be spot cleaned daily. A thorough cleaning should be performed on a regular basis. A 5% bleach solution is an excellent disinfectant. Be sure to thoroughly rinse the enclosure before replacing the substrate and placing the tortoise

back in the enclosure. It is always recommended to wash your hands thoroughly after handling the tortoise or cleaning the cage or cage accessories.

Heating: To begin with, never use a hot rock as a heat source. Hot rocks are the worst, especially for a tortoise! Your tortoise (particularly a hatchling) has very a sensitive shell and skin, and any contact with the hot rock can cause severe skin and/or shell burns, which could be, in a worse case scenario, fatal! The very best ground heat source for all reptiles is an under-tank heater or heat pad. However, tortoises do best with basking heat from above, as it replicates the natural heat from the sun. You want to be sure that your basking heat source is not too high of a wattage for the enclosure size and type. As a precautionary note, it is important to remember that most of these heaters raise the temperature 15 degrees F (8 degrees C) or so above ambient temperature. In the event that the temperature of your home rises over 80 degrees F (27 degrees C), this heat source should be shut down until the room temperatures drop back to normal. The enclosure size should be as large as you can make it to start out with, but minimally, about 2 feet long and 1 foot wide for a hatchling, nothing smaller than that. It should be noted that this tortoise (and tortoises in general) are not suited for a "vivarium-type" enclosure such as a fish tank or glass aquarium, and should be housed in an open enclosure-type environment. It isn't difficult to build a tortoise table. This turtle table is suitable for many kinds of tortoise. Many people house their hatchlings in the smaller enclosure that I described above for the first few months to a year of age, after that, a larger pen or enclosure is a must.

Lighting: If outdoor time under direct sunlight is not provided, a fluorescent full spectrum UVB bulb is necessary for the proper development of your tortoise, from the hatchling stages through adult, and should always be provided, along with a basking bulb for heat. You cannot provide these UVB rays by placing your enclosure near a window for sunlight. Sunlight filtered through most regular window glass will filter out all beneficial rays, including UVB, leaving you with just another light source. UVB is necessary for the animal to produce Vitamin D3, which aids in calcium utilization for healthy shell growth. Remember, all so-called "full spectrum" lights do not provide UVB rays. Most incandescent heat bulbs will state that they are full spectrum, but do not have UVB rays. Many reptile fluorescent full-spectrum bulbs will look deceptively like the one you might need. If the box of bulb does not specifically state "UVB" it is not the one you need. Please don't get confused between a heat/basking bulb and a fluorescent bulb. The bulb that you need is long, skinny, fluorescent bulbs, not screw in light bulbs. There has been some research that indicates that if a calcium supplement that contains Vitamin D3 is used the UVB is not necessary, I use both as I consider the added light to be necessary for the proper behavior of the animal.

Temperature: It is extremely important to monitor temperature. Get one or two good thermometers and mount it/them to the enclosure. Make sure you are able to accurately calculate the floor temps with all heating and lighting on so you can be sure the floor temperature, where your tortoise resides, is not too hot. If the thermometer is just mounted on the wall without first checking the floor temperature, it can deceptively appear as if the temperatures are in a good range when really they may be too hot. I have two of the Radio Shack brand indoor/outdoor digital mountable thermometers. They run about \$10 each, and are excellent and extremely accurate. They are backed with velcro and can be mounted to the side of the enclosure, but the actual thermometer section can be removed and moved around to monitor all pen temps, which is a great feature. For a small, hatchling-sized enclosure, one should suffice. However, move the thermometer around to make sure it is not too hot right under the heat lamp, in the middle, and in the cool zone. For a small enclosure, it is difficult to make a hot zone and a cool zone. In a larger enclosure, you should have the heat lamp in one area. Then, nothing in the cool zone. In my large enclosure, I only have one large basking bulb (ceramic infrared bulb-150 watt) at one end suspended from a lamp stand. The ceramic bulbs are very good and long-lasting but you must make sure if you use one that you use a dome lamp with either a porcelain or ceramic socket. A regular dome lamp with a plastic socket will melt and can be a fire hazard. The room my pen is in never goes below 73 degrees Fahrenheit. I find I am able to maintain the proper temperatures with just one heat bulb. If you find that you don't need much heat to maintain proper temperatures, do not go overboard...overheating is as bad as under heating The only light source that is necessary is the UVB lighting, so you can use the non-light producing ceramic bulb for heating effectively. Important: many people recommend keeping *G. sulcata* at very high temperatures. NOT TRUE! A good temperature zone is 85 degrees in the hot zone and 72-75 in the cool zone. If it gets too hot, 90-100 degrees F, (32 - 37 degrees C) they can become very dehydrated and experience loss of appetite, develop bladder stones and additional problems. I listened to all the conflicting information and made it too hot for the first few months I had my hatchling. I did not realize have the correct information and the importance of soakings, and consequently, my tortoise developed a bladder stone due to dehydration, which I treated with lowered temperatures and frequent soakings...and the stone was luckily and eventually passed. Don't make the same mistake!

Soaking: Soak your juvenile at least 3 times per week without fail. Your tortoise will be considered a juvenile and no longer a hatchling after about 1 year of age. A juvenile can be soaked about 2-3 times per week. An adult *Sulcata* should be still be soaked 1 time per week for the rest of its life. The water should be lukewarm and no deeper than the bottom shell (plastron). I use a plastic kitty-litter pan as a "bath tub", which is good, as the tortoise likes to see out over the rim, and it makes for an easy clean-up. My dirty "bath water" goes right into our toilet bowl. You should soak for 5-10 minutes each time and make sure the tortoise is clean and dry when he goes back in his enclosure, or for a walk around. Large tortoises should be provided a shallow outdoor pool for soaking and wading.