

# Sulcatas/African Spurred Tortoises

By Catherine Love, DVM  
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## Natural History

The sulcata (*Centrochelys sulcata*) or African spurred tortoise is the third largest tortoise in the world. This species is native to the southern edges of the Sahara desert in Africa, including the savannah and semi-deserts of Mali, Chad, Niger, Ethiopia, Sudan, Senegal, and Mauritania . During the day, these tortoises excavate burrows up to 15 feet underground to keep cool. These burrows are also important humid microclimates, which are necessary for maintaining humidity in extremely dry climates. Sulcatas have incredible water retaining abilities including thickened skin to prevent moisture loss, minimal liquid excrement, in addition to relying on these high humidity burrows. Sulcatas are abundant in captivity but their populations are declining in the wild due to human influences.

## Characteristics and Behavior

Sulcatas are sometimes referred to as “gentle giants”. They are known for their docile and curious natures and some keepers even report their sulcatas recognizing them. While most sulcatas become fairly tolerant of humans, they generally don’t enjoy handling, and as adults their size makes them difficult to handle. It’s important to keep in mind that a tiny juvenile will grow into a large, long-lived reptile. That’s why sulcatas are best suited for advanced keepers. It should also be noted that sulcatas do NOT hibernate/brumate. There may be some increases in activity during the summer and decreases during the winter, but this species does remain active year round.

## Lifespan

In the wild, sulcatas have been reported living over 100 years. In captivity, the oldest recorded sulcata was 54 years old. With proper care, sulcatas may outlive their owners.

## Adult Size

75-100lbs, possibly up to 150lbs (the record is over 200lbs!) and a carapace up to 2.5 feet. May take 10-15 years to reach full size.

## Housing

In regions where the climate is appropriate, sulcatas are best housed outdoors year round due to their size. In the Midwest, where year round outdoor housing is impossible,

they can be housed outside as long as the temperature does not drop below 55F. If night time temperatures are going to drop below 55F, a heated hide should be provided. Outdoor enclosures should have protection from wind and predators. There should also be shaded areas available so the tortoise can choose to get out of the sun. Sulcatas need at least a 24 foot barrier above ground and a 12-24 barrier below ground to keep them contained. They love to dig burrows, so don't expect your yard to survive a sulcata. Flagstone can be used to block up burrows, and hide boxes will also discourage digging in other areas. The space provided should be at least 16'x16'. Many people choose to use dog houses as hides for their sulcatas. Hatchlings should be kept primarily indoors for the first few years (other than safe, supervised outdoor access) to avoid predation. Digging and burrowing should be encouraged, though artificial burrows/hide boxes can also be provided.

For adult terrestrial turtles and tortoises, the length of an enclosure should be 10x the size of the animal, the width should be 5x, and the height 3x. That means an adult sulcata would need a massive enclosure of around 25'x12.5'x7.5'! Enclosures can be made of wood, plastic, or sometimes rubbermaid tubs. It is very difficult to find an indoor enclosure large enough for an adult sulcata and will almost definitely require having a custom made enclosure. Glass terrariums may be suitable for smaller tortoises but they will quickly outgrow them. As long as the height is sufficient to keep the tortoise from escaping, tops are unnecessary. Outdoor pens should be constructed for the summer months, as sulcatas are much healthier with outdoor access and grazing.

Cover, such as ground clutter, half logs, plants (live or fake), and rocks should be provided to help your tortoise feel more secure. For substrate, newspaper or paper towels are easy to keep clean and present no risk of impaction, but do not provide essential digging opportunities. If these substrates are used, a dig box should be provided, but deep substrate is preferable. For a more naturalistic substrate, cypress mulch, coconut coir, ReptiSoil, or reptile bark can be used at a depth of at least 6-12". Keep in mind that sulcatas may dig down 15' in the wild, so deeper substrate is best! A hide, which can be a wooden box, tupperware, commercial shelter, or cardboard with a hole cut out should be provided. If not providing natural substrate, this hide should be filled with ReptiSoil or EcoEarth to allow digging opportunities. Rocks are also useful for helping tortoises file down their nails.

## Lighting

Like all chelonians, sulcatas require UVB light to synthesize vitamin D3 in their skin. Vitamin D3 is needed for proper metabolism of calcium and prevention of metabolic

bone disease. The ReptiSun T5 10.0 HO, Arcadia T5 12% Desert, or Arcadia T5 14% Dragon are all acceptable choices, depending on where you set up your animal's basking spot. Arcadia provides a guide as to where to place your UVB fixture in relation to your chelonian's basking spot. It is important to note that UVB cannot penetrate glass, so natural sunlight through a window will not be sufficient for a chelonian to synthesize vitamin D3. Sulcatas housed outdoors receive their UVB from natural sunlight.

Sunlight is made of ultraviolet, near infrared (IR), mid IR, far IR, and visible light. It is our job as keepers to provide full spectrum lighting, which means as close to sunlight as possible. Unfortunately there is not one source for all of these components, so we must provide multiple types of lighting. For visible light, LED or halide bulbs should be provided.

UVB is NOT optional for chelonians. Lack of proper UVB can lead to impaired skeletal, muscle, and immune function. Replace UVB bulbs every 6 months, as they can continue to give off light even when not producing UVB. Lights should be turned off at night to maintain normal day/night cycles. For this reason, red or black nightlights should not be used as they can disrupt normal day/night cycles.

Arcadia UVB guide: <https://www.arcadiareptile.com/lighting/guide/>

## Heat

Unlike mammals, reptiles cannot internally regulate their temperature and rely on their environment to heat and cool themselves. Therefore, it is important that we provide captive reptiles with a temperature gradient so they can warm up or cool down as needed. Reptiles have three temperatures to measure: basking spot, warm ambient, and cool ambient. The basking spot is the hottest area in the enclosure where they bask, the warm ambient is the air temperature on the warm side of the enclosure, and the cool ambient is the air temperature on the cool side of the enclosure. Ambient temperatures are best measured with digital thermometers (one on the warm end and one on the cool end), as analog thermometers are often inaccurate. Basking temperatures can be measured with a digital infrared thermometer.

Sulcatas need a basking spot of 95F, a warm ambient of 80F-85F, and a cool ambient of 75-80F. Any light emitting sources should be turned off at night and temperatures can drop to 70F. If needed, a non light emitting source like a ceramic heat emitter, radiant heat panel, or deep heat projector can be used to maintain temperature. Sunlight is

made of UV, near IR, mid IR, far IR, and visible light. Flood tungsten-halogen bulbs are the most efficient at producing near IR, which is the most abundant IR in sunlight, and they also produce significant mid IR and some far IR. Far IR is the least abundant in sunlight, but is most often produced in large amounts by sources like ceramic heat emitters, heat pads, and radiant heat panels. Tungsten-halogen bulbs should be the flood type to ensure a wide enough basking site. These heat producing bulbs can be found as reptile specific bulbs or at hardware stores. Avoid hot rocks as these can easily burn reptiles.

## Humidity

Low humidity appears to be a major factor in the formation of abnormal lumps on the shell (a condition called “pyramiding”). While ambient humidity can be maintained at moderate levels (40-60%), access to high humidity burrows is essential. A dig box with moist, loose substrate can be provided if it is not possible to provide deep substrate. Even though sulcatas inhabit naturally arid environments in the wild, they do not appear to tolerate consistently low humidity environments in captivity.

## Feeding

Wild sulcatas are grazers, and are known for being very enthusiastic about meal times. The bulk of their diet (75-80%) should be high fiber, low carb, and low fat roughage. This includes hay (grass, timothy, orchard), grasses, dandelions and dandelion greens, clovers, hibiscus leaves and flowers, and other leafy weeds. Ideally, a sulcata should graze outdoors on a pesticide free lawn. 20-25% of the diet should be vegetables and leafy greens including endive, cactus pads, arugula, escarole, peppers, squash, pumpkin, zucchini, cucumber, turnip greens, and radish greens. No more than 0-5% of the diet should be fruit, as fruits are very sugary. Appropriate fruits include berries, bananas, apples, and melon. Avoid rhubarb, avocado, onion, and garlic. Dietary variety is extremely important to prevent vitamin and nutrient deficiencies. Sulcatas should be fed daily.

A calcium carbonate based calcium powder with no phosphorus should be sprinkled on salads 2-3x/week, and a multivitamin supplement with vitamin A should be provided weekly for adults. Reproductively active females and hatchlings should be supplied with calcium daily, and juveniles should receive calcium supplementation 3-4x/week. Repashy SuperVeggie is a good multivitamin for tortoises. If you are providing adequate UVB, calcium powder does not need to contain D3. Arcadia, Repashy, and ZooMed all have good products. Follow your brand’s recommendations to avoid overdosing.

Animal proteins, bread, oats, candy, and other high sugar foods should be avoided. High protein and rapid growth may be associated with health issues.

## Water

Fresh water large enough to soak in, but not so deep that they have to swim, should always be provided. Sulcatas often drink and defecate at the same time so water dishes may need to be cleaned daily. Sulcatas housed outdoors also enjoy mud pits. 10-15min of weekly soaking in a lukewarm bath up to the tortoise's chin may also encourage proper hydration.

## Sexing

Males have a longer and thicker tail, along with an “anal scute” next to the tail that is wider than a female’s. A male also has a slightly concave plastron to make it easier to mount the female, along with prominent gular scutes (the scutes closest to the head). Sexual maturity is reached around 5-8 years.

## Zoonosis

Like other reptiles, sulcatas can carry *Salmonella*. Always wash your hands after handling reptiles or items from their enclosure.

## Health

Bladder stones are very common in sulcatas. These stones can become so large that they completely obstruct the tortoise’s ability to eliminate waste, and they are extremely painful. It is thought that bladder stone formation may be related to chronic dehydration, vitamin deficiency, calcium deficiency, inappropriate diets, and lack of exercise. Sulcatas may also be prone to malnutrition (especially vitamin A deficiency), beak overgrowth, nutritional-secondary hyperparathyroidism (metabolic bone disease), and reproductive problems. Shell pyramiding is very common in sulcatas, and previously thought to be caused by excessive dietary protein and rapid growth. Newer evidence is pointing to low humidity, but studies are ongoing. A healthy sulcata’s shell is quite smooth and uniform, and it should not have raised lumps. Your sulcata should be examined by your veterinarian every 6-12 months.

### Sources and Further Reading:

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