

# Greek Tortoise

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## Natural History

The Greek or spur-thighed tortoise (*Testudo graeca*) is a member of the Testudinidae family. This family includes a total of 5 Mediterranean tortoises; the Greek, Hermann's (*T. hermanni*), Egyptian (*T. kleinmanni*), marginated (*T. marginata*), and Russian (*A. horsfieldii*). The Greek tortoise is often mistaken for the Hermann's tortoise, but Greek tortoises have obvious spurs on each thigh and no spur on the tail. These tortoises are fairly widespread, occupying the grasslands, forests, and savannahs of Northern Africa, Southern Europe, and Southwest Asia. They can be found at sea level as well as nearly 3000 meters of elevation. There are at least 20 recognized subspecies of Greek tortoises, although their classifications are often questioned. Some subspecies have been re-labeled as distinct species of their own. Because this tortoise occupies a relatively wide variety of habitats, there may be distinctions between the color, shell shape, and size of various subspecies. Greek tortoises are considered "vulnerable" by the IUCN.

## Characteristics and Behavior

The most common subspecies in the pet trade are the Ibera Greek tortoise (*T. g. iberica*) and the golden Greek tortoise (*T. g. terrestris*). *T. g. graeca* is a subspecies that may commonly be referred to as the true "Greek tortoise", but it is only one of many subspecies. They are sometimes also called the North African Greek tortoise. These tortoises are relatively small and hardy compared to other species in the pet trade. Like other tortoises, they do have fairly specific care requirements and require a decent amount of space. They are long lived and prone to a number of health issues related to poor nutrition and husbandry, which makes them less suitable for novice keepers. Tortoises don't tend to enjoy handling but they are also not particularly inclined to bite. Captive bred specimens are preferred over wild caught animals, as wild caught animals are more likely to be ill and their capture may contribute to population declines.

## Lifespan

50+ years. A 127 year old Greek tortoise has been recorded.

## Adult Size

Some subspecies may reach up to 12 inches, but 5-8 is more common. Females tend to be larger than males.

## Housing

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 a Greek tortoise needs approximately a 60"x30"x18" enclosure depending on the size of the animal. Bigger is always better! Enclosures can be made of wood, plastic, or sometimes rubbermaid tubs. Glass terrariums may be suitable for smaller tortoises but more difficult to find appropriate sizes for larger ones, and some tortoises may be stressed by non-covered sides. As long as the height is sufficient to keep the tortoise from escaping, tops are unnecessary. Outdoor pens can also be constructed for the summer months.

Cover, such as ground clutter, half logs, plants (live or fake), and rocks should be provided to help your tortoise feel more secure. Greek tortoises tend to prefer low-lying shrubbery rather than thick canopies, as this is more similar to their natural environment. For substrate, newspaper or paper towels are easy to keep clean and present no risk of impaction, but do not provide burrowing opportunities. If these substrates are used, a dig box should be provided. For a more naturalistic substrate, cypress mulch, coconut coir, ReptiSoil, or reptile bark can be used at a depth of at least 4-6". 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.

When temperatures are above 60F, Greek tortoises can be housed outside. They should be in an escape proof and predator proof enclosure. A shallow pool of water, hidebox, and burrowing opportunities should be provided. It is necessary to bury a barrier at least 8 inches underground to prevent your tortoise from escaping. Outdoor housing is extremely beneficial for tortoise health.

## Lighting

Like all chelonians, Greek tortoises 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 5.0 HO, Arcadia T5 12% Desert, or Arcadia T5 6% Forest 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. Allowing safe outdoor time is also an excellent source of UVB and visible light.

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.

Greek tortoises need a basking spot of 90-95F, a warm ambient of 80F-85F, and a cool ambient of 70-75F. Any light emitting sources should be turned off at night and temperatures can drop into the 60s. Around 40-50F Greek tortoises will start to brumate (similar to hibernation in mammals). 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

Most subspecies do well with a moderate humidity of 30-50%, but *T. g. graeca* generally needs a higher humidity of 40-75%. This should be measured with a digital hygrometer. A hide box with moist moss or substrate can also be provided as a humid microclimate. This can be a tupperware bin or a purchased hide. Daily misting 1-2x per day can also provide humidity spikes. Poor ventilation and high humidity are a common cause of shell rot and respiratory infections in these species, so care should be taken to not keep the enclosure too wet.

## Feeding

Like other tortoises, Greek tortoises are primarily grazers. They eat thistles, flowers, grasses and weeds, and other vegetation. Greek tortoises need a plant based diet that is high in fiber and calcium and low in carbs. Greek tortoises should be fed staple foods daily, occasional foods 3-4x per week, and rare foods no more than 1-2x per week. A commercial tortoise diet should also be provided approximately 2x per week for juveniles, and can be provided 1-2x/week for adults. Mazuri is a good brand for tortoise food. 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. 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.

For tortoises housed outside, they will graze on vegetation in the yard. It is still beneficial to provide occasional greens or veggies sprinkled with calcium and a multivitamin to ensure deficiencies don't occur. Dietary variety is extremely important for preventing nutrient deficiencies.

Staple: Endive, escarole, mustard greens, dandelion greens, arugula, clover, mulberry leaves, squash, collared greens, and cactus pads. Grass hay can also be offered. Additionally, grasses, weeds, and shrubs from your garden are excellent tortoise foods, as long as they are pesticide free.

Occasional: Alfalfa sprouts, cilantro, pumpkin, peppers, wheat grass, cucumber, rosemary, celery, zucchini, romaine, cabbage, cilantro, radish, garbanzo beans, kidney beans, pinto beans, hibiscus, dandelion flowers, rose petals.

Rare: Blackberries, strawberries, blueberries, cherries, watermelon, oranges, prunes, soybean, banana, peas, rice, melon, beets, broccoli, apples, corn, carrots, egg (hardboiled), tomatoes, star fruit, potato, parsley.

Do not feed insects, meat, dairy products, rhubarb, garlic, mushrooms, avocado, or onion. Iceberg lettuce is very low in nutritional value and should be avoided in excess. Kale and spinach are high in oxalates and can interfere with calcium absorption.

## Water

Clean water that is deep enough to soak in should always be available. Soaking can also be done 2-3x weekly to stimulate defecation.

## Sexing

Males have a longer tail and a concave plastron (lower shell), and the cloaca (vent) will be closer to the tip of the tail. Females tend to be larger and their cloaca is closer to the shell.

## Zoonosis

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

## Health

Greek tortoises are fairly hardy but may be prone to malnutrition (especially vitamin A deficiency), beak overgrowth, nutritional-secondary hyperparathyroidism (metabolic bone disease), respiratory infections, reproductive problems, and shell rot. A healthy tortoise is bright and alert with no signs of discoloration or deformities of the shell. Bubbling from the mouth or nose, puffy eyes or eye discharge, shell abnormalities, loss of appetite, and lethargy are signs that a tortoise is in need of medical attention. Your Greek tortoise should be examined by your veterinarian every 6-12 months. Greek tortoises naturally brumate (hibernate) over winter, but ill tortoises should never be brumated as this can be deadly.

## Sources and Further Reading:

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