

Savannah Monitor

By Catherine Love, DVM

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Natural History

Savannah monitors (*Varanus exanthematicus*) are native to savannahs, rocky deserts, and open woodlands in west and central Africa, south of the Sahara. In Europe, this species is often referred to as Bosc's monitor. Savannah monitors are part of the family Varanidae, which includes Komodo dragons and Nile monitors, although savannahs do not reach the same size as these larger lizards. These monitors are fairly popular in the pet trade, with both wild caught and captive bred individuals being available. Wild monitors are threatened by collection for the pet trade, hunting, and habitat loss. Savannah monitors are diurnal and terrestrial, but are also proficient swimmers and diggers. Monitors are unique compared to other reptiles, in the sense that they tend to have a much higher oxygen use and metabolic rate compared to other lizards.

Characteristics and Behavior

While savannah monitors are considered medium sized monitors, they are still large lizards with large space requirements. Monitors are capable of delivering powerful bites, and have strong tails and claws that can do damage as well. Therefore, savannah monitors should only be kept by advanced keepers. Savannahs are intelligent reptiles and often become quite tame with the proper effort, but some may always remain flighty and difficult to handle so one should not start savannah ownership with the expectation of a dog-tame reptile. Like other monitors, savannahs are not capable of tail autotomy (dropping their tails).

Lifespan

10-15 years.

Adult Size

2-4 feet, up to 13lbs.

Housing

The general rule for housing lizards is that they need an enclosure at least 3x their length. That means a 4' savannah would need at least a 12' enclosure, but bigger is always better. At least 4-5' in width and 2-3' in height will also be needed to house an adult savannah. It will likely be necessary to find custom made enclosures for larger

adult savannahs. Savannahs are very territorial and should not be housed with other monitors. It is recommended to have a secure, escape proof enclosure for these large lizards. They should have access to an elevated basking spot to allow them to move closer to or farther away from heat sources. This can be accomplished with branches, rocks, and logs. Reptiles should have at least one hide on the warm end of their enclosure and one on the cool end of their enclosure so they don't have to choose between thermoregulation and security. Rocky ledges and flagstone or slate for basking and hiding are also great enrichment options, particularly because wild Savannah spend their time basking on flat rocks. Ground clutter, plants (live or fake), and corkwood logs can also be provided to create cover and enrichment. Lizards this large may need small pet carriers or covered litter boxes as hides.

There is no "best" substrate; all have pros and cons. Loose substrate, when combined with improper husbandry, can lead to life threatening impactions. Tile and newspaper have no risk of impaction, but do not allow natural burrowing or digging behavior. Newspaper or butcher paper may be placed on top of tile to allow the monitor to burrow between layers. Tile offers the benefit of acting as a filing surface for a monitor's nails. If these options are used, a dig box with soil must be provided to allow the monitor to perform natural behaviors.

For loose substrate, a layer deep enough to dig and burrow should be provided (at least 1'). A mixture of ReptiSoil and cypress mulch or orchid bark can be used to create a humidity holding, burrow-friendly environment.

Avoid CalciSand, VitaSand, crushed walnut, gravel, and corncob as these substrates carry a much higher risk of impaction. Always talk to your veterinarian before using loose substrate to ensure your lizard is healthy and your husbandry is correct. When using loose substrate, food should also be offered on a feeding dish to avoid ingestion of substrate. Live prey can also be offered with tongs.

Lighting

Savannah monitors are diurnal, meaning they are active during the day. Like all lizards, savannahs 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 Arcadia T5 12% Desert, or Arcadia T5 14% Dragon are both acceptable choices, depending on where you set up your monitor's basking spot. The ReptiSun 10.0 T5 is also an acceptable choice and may be available locally while Arcadia is easier found online. Arcadia provides a guide as to where to place your UVB fixture in relation to your

lizard's basking spot. UVB fixtures should be roughly as long as half your reptile's enclosure length. It is important to note that UVB cannot penetrate glass, so natural sunlight through a window will not be sufficient for a lizard to synthesize vitamin D3. Allowing safe outdoor time is also an excellent source of UVB and visible light. Lizards taken outdoors should be kept in an escape-proof and predator-proof, non-glass enclosure. Provide shade and basking spots so your lizard can regulate their temperature.

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 lizards. 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/> (please note that savannahs are listed as "Bosc monitor").

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.

Savannah monitors have been documented in the wild basking on surfaces nearly 140F! They tolerate very warm temperatures and benefit from having a thermal gradient to choose from, particularly with different basking surfaces. There is not quite a

consensus on temperatures in captivity, but many keepers keep the warmest basking temperature at 120-130F, with air temperature around 95-110F. Cool side air temperatures can be maintained around 78-85F. Keep in mind the distinction between SURFACE and AIR temperatures; surface basking temperatures may reach much higher temperatures than would be safe as an ambient air temperature. Any light emitting sources should be turned off at night, but a non light emitting source like a ceramic heat emitter, radiant heat panel, or deep heat projector may be needed to keep the temperature in the low-mid 70s. 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. A cluster of bulbs may be needed to provide a basking site large enough for an adult monitor. Avoid hot rocks as these can easily burn reptiles.

Humidity

Wild savannah monitors live in fairly dry environments, but spend much of their day in humid burrows. Therefore, it is beneficial to measure the humidity of your savannah monitor's burrows or dig box, depending on what you are providing. Exo Terra, Zilla, and other companies have digital hygrometers (which may also have a thermometer) with probes that can be inserted into the burrow or hide box, depending on what you are providing. Humidity in the burrow/hide should be maintained at 70-90%. Humidity in these microclimates can be maintained with moist moss and/or regular misting, but make sure mold doesn't grow. Ambient humidity can be maintained at a moderate level of 40-50%, which should be measured with a digital hygrometer. Occasional misting can be done to increase humidity if needed.

Feeding

Like other monitors, savannahs are voracious carnivores and consume a wide variety of vertebrate and invertebrate prey. They are known to eat insects and other arthropods (i.e. arachnids, crustaceans), eggs, snails, other reptiles, amphibians, birds, carrion, and small mammals. There is still some debate about the full make-up of a wild savannah monitor's diet.

Young savannahs eat primarily insects, while adults eat more of a variety of animal protein. Hatchlings (up to 1' in length) should be fed gutloaded insects every 1-2 days,

with occasional pinkie/fuzzy mice, ground meat, scrambled/hard boiled eggs, or fish. Pinkie mice/rats should especially be fed in moderation, as these are very high in fat. Juveniles and subadults (up to about 2 years) should be fed 3-4x/week. This age group still consumes a large portion of insects, but other food such as earthworms, rodents, chicks, fish, and king mealworms can also be added to the diet. Once monitors reach approximately adult size and go through sexual maturity, they can switch to an adult feeding schedule. Adults should be fed 1-3x/week, depending on their body condition. Obesity is a common problem in these lizards. Adult monitors can continue to consume the same foods as other age groups, but the staple of their diet should be vertebrate prey such as rodents, chicks, and fish. There have been some thoughts that over-consuming haired prey (i.e. rodents, rabbits) may increase the risk of gastrointestinal blockage. Eggs, invertebrates, beef heart, and ground meat can also be offered occasionally to provide variety. Commercial products such as Repashy, Mazuri, or Reptilinks can be used as well as protein sources. The occasional high protein, low carb cat or dog food is also acceptable as a mix in or treat. It is important to remember that skeletal meat (i.e. chicken breast) and ground meat are likely deficient in calcium, so they do not make good staple foods.

Insects are naturally deficient in calcium and low in nutritional value. In order to make them nutritious for reptiles, all insects should be gutloaded (fed a highly nutritious meal 24-48 hours before feeding). Repashy BugBurger or Arcadia InsectFuel are good choices for feeding feeder insects. Insects should also be dusted with calcium powder 1-2x/week. Calcium powders should be calcium carbonate based and should not have any phosphorus. 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.

As intelligent lizards, savannah monitors may enjoy consuming their food via food puzzles or feeder toys. Some toys marketed for small dogs or cats will be an appropriate size for monitors, or you can make your own.

Water

A water dish large enough to soak in should always be clean and available. Savannah monitors may also appreciate the occasional opportunity to soak in a kiddie pool as enrichment.

Sexing

Sexing can be tricky, but in general, male monitors have more prominent hemipenal bulges and broader heads. Males are also noted to be a bit bolder than most females, though this is not a hard and fast rule. Sexual maturity occurs around 1.5 years.

Zoonosis

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

Health

Savannah monitors tend to be hardy lizards but are prone to a number of diseases including nutritional-secondary hyperparathyroidism (metabolic bone disease), obesity, dysecdysis (improper shedding), and reproductive disorders. Savannah should be examined every 6-12 months by your veterinarian. A healthy savannah has bright eyes that are clear of discharge, strong muscles, and can easily hold themselves upright. When in a new environment, a healthy monitor will tongue flick to assess their surroundings. Sick savannahs may lay still, or nearly still, with their eyes closed. Their muscles may be weak and they do not resist when their limbs are gently extended/pulled. Young savannahs are particularly prone to nutritional deficiencies due to their rapid growth. Any signs of kinking in the spine or tail, bowed limbs, muscle tremors, lethargy, or weakness should be further investigated. Weighing pet reptiles 1-2x weekly can help monitor trends and assess if a reptile is not feeling well faster.

Sources and Further Reading:

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- *The Arcadia Guide to Reptile and Amphibian Nutrition*
- Facebook: Advancing Herpetological Husbandry