

# Ball/Royal Python

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## Natural History

Ball pythons (*Python regius*), also known as royal pythons, are a small-medium sized constrictor native to open forests and grasslands of central and western Africa. They are the most legally traded live animal from the African continent. They are crepuscular (most active at dawn and dusk), often spending the heat of the day in a burrow constructed by another animal. A long-standing myth for ball pythons is that they only spend time in small, dark, barren spaces such as termite mounds. Termite mounds are massive structures that can easily tower over adult giraffes, reaching more than 4 meters in height. Additionally, ball pythons can be considered semi-arboreal, as males and juveniles in particular have been documented hunting in trees, and birds have been shown to even make up a large portion of a male ball python's diet. The difference in feeding behavior is striking enough that male ball pythons have been found with different ectoparasite loads consistent with arboreal tendencies. Ball pythons are ambush predators that wait for prey to come to them before striking.

## Characteristics and Behavior

Ball pythons are one of the most popular pet reptiles in the US. They are docile, unlikely to bite, hardy, and come in a large variety of color patterns known as morphs. While ball pythons are often considered beginner reptiles, they are more appropriate for a slightly more experienced keeper, as they require a fair amount of space and may be more difficult to keep correctly than other "beginner" species.

A ball python's main method of defense is, as the name suggests, curling into a ball. They may also hiss or strike when extremely stressed, but it is not often that these snakes bite. Ball pythons can be shy, though they tend to become tame with some effort. To help your ball python feel more comfortable during handling, scoop them up under their body rather than picking them up from the top. Predators grab snakes by the head and dorsum, so this is inherently stressful for prey species.

Part of the appeal of owning a ball python is the large variety of color morphs available. While "normal" or "wildtype" morphs are the most commonly acquired by new keepers, there are thousands of color varieties that are being produced by breeders. It is important to note that not all color morphs are healthy. Scaleless snakes may be more prone to dehydration and shedding issues. The popular morph known as the "spider"

(and any morphs mixed with this one) have an unfortunate neurologic condition called wobble. Wobble can range from a slightly wobbly head, to the inability to remain upright and eat. This condition is linked to the “spider” pattern, making it ethically questionable to breed these morphs. Special consideration should be taken if one of these morphs is acquired to ensure they are able to eat and have a good quality of life.

## Lifespan

15-30 years.

## Adult Size

Males 3-4 feet, females 4-5 feet.

## Housing

It is a myth that ball pythons, or any reptiles, are stressed by too much space. Reptiles are stressed by too much exposure; that is, a space that is not properly furnished with cover and hiding spots. This myth has led to the perpetuation of poor husbandry practices that promote keeping these animals in tiny, sparse conditions. Warwick et al. in "Spatial considerations for captive snakes" (2019) noted that, “Extensive natural home ranges...dismiss notions that snakes do not use space. Indeed, were snakes truly both sedentary and agoraphobic then keepers would require no vivaria frontage or lids and could open all enclosures confident that snakes would not leave the proposed security of their cages. However, snakes will freely leave their enclosures when permitted to do so and they are known for their abilities to escape captive environments.” In the same paper, it was also noted that, “Established captivity-stress related behaviors are also commonly associated with snakes in small enclosures.” Ball pythons placed into restrictive containers have been noted to have increased stress hormone levels, consistent with poor welfare.

At minimum, snakes should be able to stretch out to their full length. Ball pythons need at least a 4'x2'x2' enclosure, but larger females will need a 5'x2'x2'. Ground clutter, logs, branches, plants (live or fake), and rocks should all be used to create more cover and security for your ball python. Enclosure furnishings allow pythons to perform natural stress avoidance and reduction behaviors. 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. It is a good idea for one of these hides to provide a humid microclimate to aid with shedding. The snake should also be able to move closer to or further away from the basking source. It may be difficult to maintain humidity in a glass, screen top enclosure, so part of the screen may

need to be covered with a damp towel or foil tape. PVC enclosures are also excellent choices for ball pythons, as they can hold humidity better.

The optimal substrate for ball pythons helps hold humidity. ReptiChip or cypress mulch mixed with ReptiSoil or Jungle Mix can make a great humidity holding layer. Substrate should be at least a few inches deep to help hold humidity without letting the substrate get too wet. The BioDude's TerraFirma is also an acceptable choice, particularly for keepers choosing to go bioactive. Avoid pine and cedar based beddings as these are toxic to reptiles.

## Lighting

Because snakes consume a whole-prey diet, they don't technically need UVB to synthesize vitamin D and metabolize calcium. However, UVB is beneficial for all species and should be considered a part of best care practices. UVB enhances immune function and promotes normal day/night cycles. Anecdotally, many keepers report more basking activity in their snakes when UVB is provided. The ReptiSun HO T5 5.0 is acceptable, as is the Arcadia T5 6% Forest or Arcadia T5 7% shadedweller, depending on where you put your ball python's basking spot. Arcadia provides a guide as to where to place your UVB fixture in relation to your snake's basking spot. UVB fixtures should be roughly as long as half your reptile's enclosure length. UVB bulbs should be replaced every 6 months; even if they are emitting light, they may not be emitting adequate UV. It is important to note that UVB cannot penetrate glass, so natural sunlight through a window will not be sufficient. Allowing safe outdoor time is also an excellent source of UVB and visible light. Snakes taken outdoors should be kept in an escape-proof and predator-proof, non-glass enclosure. Provide shade and basking spots so your snake can regulate their temperature.

It is tempting to say that ball pythons don't need UVB because they're nocturnal, but even nocturnal and crepuscular snakes are exposed to sunlight in the wild. Nocturnal or crepuscular snakes may emerge during the day, and when they are hiding, they hide in sheltered areas where sunlight reaches them in small amounts. When keeping reptiles, our goal should be to replicate their natural environment as closely as possible, which includes replicating full spectrum lighting (the sun).

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. Light sources should be turned off at night to promote 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.

Ball pythons require a basking spot of 95-100F, a warm ambient of 85-90F, and a cool ambient of 75-80F. The air temperature should not exceed 92F. 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. Avoid hot rocks as these can easily burn reptiles.

## Humidity

Ball pythons need an ambient humidity of 60-80%, which should be measured with a digital hygrometer. Humidity can drop lower on the hot side, but the cool side should not drop below 55%. Maintaining humidity can be difficult, so having a deep layer of substrate, which water can be poured onto to keep it humid but not wet, is a good way to maintain the proper levels. A large water bowl and covering screen tops with a damp towel or foil tape are also helpful. Ball pythons should also have a humidity hide, which

may need to be made from a tupperware container to find something large enough for them. Damp moss can be kept in the hide to create a humid microclimate.

## Feeding

Obesity is a common problem in ball pythons, and it should be noted that many feeding guides are geared toward breeding animals, which are brought up to breeding weight as fast as possible. Traditionally, ball pythons have been maintained on nothing but feeder rodents. However, it has been shown that males in particular eat a large amount of birds. Wild ball pythons will also consume other species such as mustelids, bats, and various types of birds and rodents. Therefore, it may be beneficial to offer a variety of food items to captive ball pythons, both for enrichment purposes and to prevent nutritional deficiencies.

Depending on the snake's size, mice, rats, chicks, quail, gerbils, African soft furred rats, or other bird/rodent feeders are all acceptable options. Food should be approximately the size of the largest part of your ball python's body. Some keepers also choose to do "nest raids", where they provide a larger number of small prey items as enrichment. Live prey should be avoided, as live animals can seriously injure your snake. It may take time to transition a snake from live to frozen/thawed, but the majority of snakes can make the change with time.

Ball pythons are known to be "picky" eaters, going off feed for months at a time with seemingly no reason. While the reason is often husbandry related, ball pythons are also adapted to an infrequent feeding schedule. Their metabolism is very slow, and it takes up to 2 weeks for an adult ball python to return to a normal metabolic state after eating. It is also normal for males to fast during the winter months, which coincides with the breeding season. When your snake is fasting, weigh them regularly to ensure they do not lose more than 10% of their body weight. Feeding schedules and feeder sizes should be adjusted based on the snake's body condition. When looking at a ball python's spine, they should be a soft triangle shape. When bent, a ball python should not have excessive rolls. Do not handle your snake for 24-48 hours after feeding as this can cause regurgitation.

Feeding schedule:

Up to 6 months: 1x/week

6-12 months: Every 1-2 weeks

1-2 years: Every 2-3 weeks

>2 years (adult size): Every 3-6 weeks

## Water

A clean dish of water large enough for the snake to soak in should always be provided.

## Sexing

Females tend to be larger than males, but the only way to know for sure is to have your veterinarian probe your snake to check their sex.

## Zoonosis

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

## Health

Dysecdysis (difficulty shedding) is a very common problem in ball pythons. Scale rot, stomatitis (mouth rot), and respiratory infections are also common. Recently, ball pythons have been afflicted by a virus called “nidovirus”, which causes severe respiratory disease. Boids and pythons are also prone to inclusion body disease, which causes regurgitation and progressive neurologic disease. Ball pythons should be examined by your veterinarian every 6-12 months.

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- *Mader's Reptile and Amphibian Medicine and Surgery*
- *The Arcadia Guide to Reptile and Amphibian Nutrition*