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Reptiles and UVB

UVB:

UVB is a necessary part of the process in which vitamin D₃ is produced in the skin of humans and animals, and is also what causes sunburn in humans. The vitamin D₃ that is produced is responsible for regulating calcium metabolism. Vitamin D₃ is obtained through diet or UVB exposure. Since most reptile species are unable to utilize dietary vitamin D₃, they must have access to UVB. A lack of UVB and vitamin D₃ can ultimately result in metabolic bone disease in reptiles, and rickets in humans. Nearly all animals that are active during the day are exposed to UVB.

In the early days of keeping reptiles, little was known about the specialized lighting requirements of the majority of reptile species. During this time, reptiles housed indoors were not exposed to UVB, and as a result would often develop Metabolic Bone Disease (MBD). MBD causes reptiles' bones to become soft resulting in severe deformities of the spine, broken legs, and soft jaws. In severe cases, the internal organs would calcify and become hard which ultimately resulted in death.

The majority of the cases of MBD occurred in Green Iguanas due to their popularity as pets, and to the fact that UVB exposure was necessary in order for them to remain healthy. Zoo Med understood that Iguanas kept outdoors did not develop MBD, while Iguanas fed the same diet but housed indoors did. This prompted Zoo Med to experiment with UVB in fluorescent lighting, and ultimately led to the release of the ReptiSun line of UVB lamps. Zoos, Veterinarians and hobbyists soon learned that all but the worst cases of MBD were reversible upon exposure to Zoo Med's ReptiSun lighting. In addition, reptiles that had access to UVB from ReptiSun lamps as hatchlings never developed MBD.

We now know that most diurnal (daytime active) reptiles require UVB. Since the release of the ReptiSun UVB lamps, dozens of scientific studies have confirmed their beneficial effect on reptiles. From the results of these studies, we can now make recommendations on exposure times, distances, and lamp replacement intervals.

Researchers have determined the UVB levels required by some reptile species in captivity. For tropical species, including chameleons and Iguanas, UVB levels of 13 to 30 W/cm² (microwatts per square centimeter) are recommended when lamps are used 10 to 12 hours per day. Desert species (e.g. Bearded Dragons) can tolerate slightly higher levels from 13 to 150 W/cm². For all reptile species, it is important to provide a UVB gradient that allows the reptile to adjust its UVB exposure. All reptiles should have access to a minimum of 13 microwatts of UVB in order to synthesize vitamin D₃, metabolize calcium, and maintain healthy bone density.

Lamps that emit less than 13 microwatts at the reptiles basking site should not be used as they are likely incapable of providing sufficient UVB. Reptiles that do not get enough UVB are in danger of developing Metabolic Bone Disease. Reptiles also require heat in order to benefit from UVB and synthesize vitamin D₃. Levels above 150 microwatts are seen in nature, but can be dangerous in a captive setting. Screen covers on terrariums filter out a portion of the UVB from all lamps, while glass and most plastics filter out 100% of the UVB.

UVA:

It is well established in the scientific literature that reptiles and amphibians can actually see UVA. This has also been documented in birds and fish. Humans have three different types of cones in our retina, each one being sensitive to different wavelengths. From these three types, we are able to make up our entire color spectrum. Humans that are red/green colorblind lack the third cone type and only have two. Birds, reptiles and amphibians possess FOUR different cone types instead of three. The fourth cone is sensitive to emissions in the UVA portion of the electromagnetic spectrum. This fourth "primary color" makes up the birds entire range of visible light.

By not providing UVA, reptiles are essentially colorblind. It is similar to the condition of colorblindness in humans. Knowing this, it could be considered negligent to deny pet reptiles access to UVA as this is essential to their psychological well being. Studies have shown that glands on the hind legs of some lizards secrete a substance that reflects UVA and is used by them to mark territories. UVA plays a role in habitat selection, species recognition, and in mate selection among reptiles and amphibians.

Types of Zoo Med UVB lamps available:

Zoo Med offers three different types of UVB lamps; linear fluorescent, compact fluorescent, and mercury vapor.

- ◆ ReptiSun 5.0 and 10.0 Linear Fluorescent: The linear fluorescent was the first UVB lamp available, and fits into standard fluorescent fixtures. These German made lamps provide UVB, UVA, and visible light. They do not provide heat. The linear fluorescent ReptiSun is offered in two different models (5.0 and 10.0). The model used depends on the distance of the lamp to the reptile and the amount of UVB required. In addition to UVB, heat is necessary for vitamin D₃ synthesis and must be provided by a separate heat source. These lamps come in a variety of lengths depending on the size of the cage. Independent scientific studies have shown that these lamps are effective for a minimum of 12 months.
- ◆ ReptiSun 5.0 and 10.0 Compact Fluorescent: Compact fluorescent lamps have a screw base and screw into a standard clamp lamp fixture. They are self-ballasted and do not require a separate ballast. These also provide UVB, UVA, and visible light. They do not provide heat. The compact fluorescent ReptiSun is offered in the same two models (5.0 and 10.0) as the linear fluorescent line. Again, heat is necessary for vitamin D₃ synthesis and must be provided by a separate heat source. These lamps offer the convenience of providing UVB using a standard screw-base type fixture.
- ◆ PowerSun UV Mercury Vapor: The PowerSun UV mercury vapor lamps provide UVB, UVA, visible light *and* heat. This is the only lamp that provides heat in addition to UV. These lamps screw into a clamp lamp fixture with a ceramic/porcelain socket and do not require a separate ballast. The PowerSun UV is available in two wattages (100 watt and 160 watt). The wattage required depends on heat and UV requirements, and the distance of the lamp to the reptile.
- ◆ Iguana Light 5.0 Linear Fluorescent: This lamp is equivalent to the ReptiSun 5.0 linear fluorescent, and was developed to assure the consumer that this lamp is safe and effective for use with Iguanas.
- ◆ ReptiSun 2.0 Linear Fluorescent: The ReptiSun 2.0 linear fluorescent provides UVA and bright visible light, but does provide significant levels of UVB. Amphibians and snakes have specialized retinas that allow them to see UVA. This lamp is a good choice for these species.