

## **General Requirements for Reptile Containment**

Our topics for this week are:

- Reptile enclosure construction
- Substrates
- Humidity
- Preferred Optimal Temperature Zones
- Light
- Water
- Cleaning

Reptile health is highly dependent on their containment. They are high maintenance animals because of the complexities of maintaining an environment appropriate for their species. Enclosures must match the species native region's humidity, temperature, exposure to light, color of surroundings, walking surface, climbing options, hiding places, access to water, and sometimes, social interactions.

Cramped containment, improper heating, difficult shedding, and territorial issues with others in the enclosure are just some of the ways in which containment can affect the attitude of reptiles and their handling safety.

### **General Considerations**

Vivariums are enclosures designed to mimic a natural environment. A terrarium is an enclosure for terrestrial (land) animals. Terrariums may be desert-like, and some may be forest-like, including trees for arboreal reptiles to climb. An aquarium is for a water environment. Some reptiles are semi-aquatic and require a combination environment in their enclosure. Enclosures for reptiles should always mimic their natural environment.

Terrestrial species need horizontal elongated enclosures. Arboreal species require tall enclosures. Burrowing species need extra deep substrate. All reptiles should have a place to hide in their enclosure to reduce stress. In general, the space required per reptile is at least 1½ ft per 1 ft of reptile. More active reptiles need additional space. Larger reptiles will usually bully smaller reptiles and opportunistic feeders can cannibalize others, so group housing should be restricted to reptiles of approximately the same size.

All reptiles require secure containment since they are all escape artists, especially snakes. Lids made of wire mesh or plexiglass with holes should be used to prevent escape but permit ventilation.

Wood cages should not be used because of the inability to be properly sanitized. All reptiles need appropriate space and hiding areas. Cage furniture that blends with the reptiles coloring should be provided to reduce stress. Mirrors should not be present in enclosures due to males being stressed over apparent invasion of their territory by a rival male and may injure

themselves fighting their reflection. Males should also not be in view of other males in nearby enclosures. Therefore, transparent wall enclosures are undesirable.

Reptiles also all require an area to bask in warmth and a hiding location to relieve stress. Adaptation to new environments of about a week should be permitted prior to handling. Cages may be warmed with basking lamps or heating pads placed underneath the cage. Heat rocks often cause thermal injuries and should not be used. Because of the use of water and high humidity in many vivariums, all electric circuits should be wired with Ground Fault Interrupters (GFI) to disconnect the electricity in situations that could cause electrical shock to the animals or handlers. Hide boxes, which may be fashioned from stacked rocks and a piece of slate or branches, are useful to relieve stress and reduce the risk of becoming aggressive or overly defensive.

Arboreal lizards and snakes need enclosures with vertical space and structures to climb and rest on. Branches from hardwood trees may be used, but prior treatment by baking, boiling, or soaking with diluted bleach solution is necessary to prevent introducing pathogens from wild reptiles or birds to the enclosure.

### **Substrate**

Oils in cedar or pine shavings and walnut shells are potentially toxic to reptiles and should not be used as substrate. Safer substrates are artificial turf, orchid bark, alfalfa pellets, newspaper, peat moss, or sand. Corn cobs and mulch are hard to keep clean, they mold easily, and may cause impactions if eaten. Neither soil nor sawdust should be used because of their ability to retain too much moisture, which can sustain disease producing organisms and due to the risk of introducing parasites to the enclosure. Rocks or gravel should be large enough to prevent it from being eaten.

Reptiles, especially snakes, should be fed in a feeding enclosure separate from their primary enclosure. Only newspaper should be used on the floor of the feeding enclosure to prevent accidental substrate impaction.

### **Humidity**

Optimum humidity for the species is needed for normal shedding, breathing, ability to eat properly, and elimination of waste products. Low humidity requirements for the species involved can contribute to abnormal shedding of skin scales. Failure for lizards to normally shed skin on their legs, toes, or tail can lead to the partially shed, attached skin to dry and create a constricture that cuts off blood supply to the affected extremity. Conversely, abnormally high humidity can promote skin infections.

Humidity needs vary widely depending on the species of reptile and the habitat in which the species evolved. Humidity should be maintained at 50 to 70% relative humidity for species from temperate climates, 30 to 50% for desert species, and 70 to 90% for tropical species. Low airflow is needed in the enclosure to maintain humidity. Higher humidity environment can be more easily maintained in enclosures that have glass or acrylic sides. It can be enhanced with misting, drippers, foggers, waterfalls, pools or shallow bowls of water, and damp towels draped over the wire top of an enclosure.

Plants can be attractive additions to enclosures but difficult to clean and eaten by the inhabitants. Hide boxes with peat moss that is regularly misted is another means of enhancing humidity. Rocks with rough but not sharp edges to rub against may aid in the shedding process.

### **Warmth**

Reptiles are ectotherms, which means that optimum external heat for the species is needed for normal activity, digestion, and immune functions. This is referred to as the **POTZ** - preferred optimal temperature zone. If reptiles get too hot, heat stress can develop. If they get too cold, indigestion or respiratory disease can result. The warm environment they require can facilitate the growth of many disease agents. Good ventilation is essential to control odors and disease microbes. Frequent cleaning is also important.

The temperature needed throughout the day by reptiles fluctuates within their POTZ. The POTZ for species from temperate climates is 78 to 86F. Semi-aquatic turtles prefer slightly lower temperatures. Tropical species should be maintained at 82 to 92F, and desert species should stay at 84 to 96F.

Heat is provided in a **basking area** of the enclosure to allow self-adjustment by the reptile moving closer or away from the basking area. The differential between basking areas and resting areas should be about 15 F. Heat lamps should be 50 to 75 watts and positioned so that there is no chance of the reptile directly contacting it. Basking surfaces for most species should be 90-100F. Basking lights should be at least 18 inches from the substrate. Ultraviolet lamps provide heat to objects in the enclosure without raising the air temperature. Supplemental heat can be provided with undertank heaters that cover no more than 1/3 of the enclosures floor. Overhead heat sources should be used for diurnal species and undertank heaters for nocturnal species. Extra care is warranted for undertank heaters which can be hazardous for burrowing reptiles.

### **Lighting**

The amount and type of lighting are important for indoor enclosures for reptiles. Lights should be timed on for 14 hours during summer months and 10 hours during winter months for tropical and subtropical species. Temperate region species need 16 hours of light in summer and eight hours in winter. Full spectrum light is needed as visible rays, UVA (long wave) light to control photoperiods, and UVB (290-310 nm) light for vitamin D formation in diurnal lizards and chelonians. UVB light can improve reptile activity and aid in maintaining healthy skin. Mercury halide or fluorescent lights can provide heat and UVB light. UVB light does not penetrate glass; therefore, lighting must be placed on the same side of glass enclosures as the reptile, in a way to prevent contact with the reptile that could cause burns. UVA and UVB lights on timers are safer and more reliable than relying on natural sunlight for enclosures. Sunlight through windows is insufficient in UVB and may lead to unacceptably high enclosure temperature.

### **Water**

Heavy objects in an enclosure, such as water bowls, should be wide based with a smooth bottom to prevent them from tipping over onto a reptile. Ceramic bowls are heavy and can be used for drinking and bathing water. Aquatic or semi-aquatic species should have 2/3 of the enclosure

water with the remainder for basking. Lizards and tortoises often defecate in water bowls. Water should be changed daily.

Small lizards such as chameleons drink water that accumulates from condensation on leaves. Misting the environment or providing a drip system is needed to encourage water consumption in these species.

### **Cleaning**

Reptile cages should be cleaned daily to remove uneaten food, waste, shed skin, and food and water dishes. Once per week the cage, substrate, and enclosure objects should be disinfected. Rocks for should be boiled for 30 minutes. Sand and branches need to be heated to 200-250°F for 30 minutes.

Rubber gloves and eye protection should be worn while cleaning the cage and its contents with mild soap and water. After cleaning, disinfection should be performed with 1 cup of household bleach/gallon of water. After disinfection, the enclosure and its contents should be allowed to ventilate for 5 to 10 minutes in a well-ventilated area and then rinsed thoroughly with water.

Now, let's recap the key points to remember from today's episode:

- Reptile health is highly dependent on providing proper heat, humidity, and light for the species involved.
- Hiding spaces must be provided for reptiles to reduce the stress of containment.
- Containments should be cleaned daily and disinfected weekly.

More information on animal handling is available in my book, *Animal Handling and Physical Restraint* published by CRC Press. It is also available on Amazon and from many other fine book supply sources.

Additional information is available at [www.betteranimalhandling.com](http://www.betteranimalhandling.com)

Don't forget serious injury or death can result from handling and restraining some animals. Safe and effective handling and restraint requires experience and continual practice. Acquisition of the needed skills should be under the supervision of an experienced animal handler.