



## CARE OF THE GREEN IGUANA

The green Iguana or common iguana (*iguana iguana*) is one of the most popular reptiles in the pet trade. In spite of this, it is also one of the most difficult to keep successfully. Prior to the purchase of the animal, the cage or the cage accessories, one should make every effort to learn about these lizards and their very specific needs. The reptile owner is responsible for creating a micro-environment, which will mimic the animal's natural condition. Reptiles are dependent on their environment to provide them with a choice of temperatures, within a range specific to each species of reptile. This range is referred to as the Preferred Optimal Temperature Zone (POTZ). Kept at room temperature within this range, a reptile will fail to thrive. Similarly, a lighting gradient should be provided, i.e., there must be areas of shade or filtered light, as well as an area of bright light in which to bask.

Ultraviolet light, specifically UVB rays, 280-315 nm, is essential to the health of the iguana. When UV rays contact the skin, they cause the conversion of vitamin D into a form, which allows the absorption and metabolism of calcium. Disturbances of calcium metabolism result in broken bones, osteoporosis, growth abnormalities, egg binding, tremors, seizures, paralysis and death. These and other signs related to calcium, temperature and lighting problems are among the most common reasons for which iguanas are presented to reptile veterinarians.

Iguanas require diets high in calcium and high in fiber – in the wild they eat leaves. However, without the provision of appropriate temperatures, an iguana cannot digest his food properly, his immune system will not function as it should and as a result, he will not grow normally and will be more susceptible to disease. Failure to meet the basic physical and psychological needs of the iguana, including the need for visual security and privacy, will cause stress. Stress leads to a weakened immune system and increased susceptibility to infection, a poor appetite and failure to thrive.

### BEHAVIOUR

Iguanas are solitary, territorial creatures. Mature animals do not form recognizable social or group structures, and they spend little time together, except during the breeding season. Females do not provide care for their young. As hatchlings, before hormones have their influence, iguanas group for safety from predators. However, once past the early juvenile stage (approximately four to six months old) iguanas should be housed individually, as they become territorial. Aggression often leads to serious, even fatal injuries. Aggressive displays by iguanas are very subtle, and owners may fail to notice signs of impending overt aggression between lizards. Some individuals, particularly among the males, are dominant, and even though they may not physically attack subordinate cage mates, subtle threats, or displays that take place when the owner is not watching are a source of considerable stress for animals that naturally live alone. It is not unusual for a dominant animal to keep cage mates from the food bowl and from the best basking spots. If iguanas must be housed together, multiple basking spots, feeding stations and water sources are necessary.



Young iguanas should be handled for just a few minutes daily, as anything more than this is stressful. Being out of the cage for any length of time will result in his body temperature dropping, and a cool iguana will not thrive (see above). When alarmed or threatened, particularly young iguanas will jump erratically. In a wild situation, they leap from branch to branch and away from danger; in captivity the results may be an unpredictable leap from a shoulder. Be prepared for these sudden leaps and handle the animal securely and close to the ground, as serious injuries can occur. Resist grabbing the tail of the iguana, as it can easily detach, as another escape mechanism. More mature animals tend to whip their powerful tails or perform a 360° degree roll in an effort to escape. The sandpaper like skin of larger animals can make this a painful experience for the handler, and gloves and long sleeves may be necessary when handling even a calm animal. Although some individuals do bite, iguanas are not an aggressive species, and such behaviors are usually just an indication of a wish to escape. Some individuals, especially mature males, can become aggressive, even though they have been handled gently all their lives. This may be seasonal and related to hormones, and may be difficult to manage. Since iguanas are by nature territorial, lizards that have free use of the house can be particularly prone to the development of defensive or aggressive behaviors. A sudden change in behavior warrants a visit to your reptile veterinarian, whether increased docility or aggression. It may signal that the animal is in pain or is ill. There are no simple solutions to dealing with a six foot, aggressive male iguana, but a discussion with your reptile veterinarian is the place to start.

Iguanas in the wild spend a great deal of time basking in the wild, particularly after eating, as the heat of the sun helps them to digest their food. At the same time the animal is absorbing beneficial ultraviolet rays, which are vital to calcium metabolism. This is why in captivity your iguana is attracted to bright light rather than to heat, as in the wild finding a nice sunny spot provides him heat as well as ultraviolet light. In captivity, therefore, an iguana's basking "hot spot" should also be the focus of the ultraviolet light.

Iguanas are prey animals in the wild, and so should be housed in relatively quiet areas, with good visual security. They are susceptible to the effects of noise and vibration, and will not enjoy being stared at by "predators", such as dogs and cats. For these reasons it is best to house iguanas in little used, quiet rooms. Iguanas that rub their noses on cage walls or dig incessantly are showing signs of stress. "Stress" can come in the form of excessive handling, improper housing or diet as well as inappropriate temperature, humidity and lighting conditions. Periodically reassess husbandry conditions and diet. Be familiar with the normal appearance and behavior of the species. Pay regular visits to a veterinarian who is familiar with reptiles, and educate yourself as to the natural history and husbandry requirements of the iguana in order to create a micro-environment that simulates the wild conditions in which the iguana is found

### **ENCLOSURE, LIGHTING AND HEATING**

Any reptile enclosure should be easy to clean, well ventilated, properly lit and adequately heated. The cage must be escape proof and secure from interference by children and other animals. Glass aquariums and terrariums can be suitable enclosures for smaller iguanas. For larger lizards, home made wood, wire, Formica and Plexiglas cages are more suitable. Greenhouses may work where the climate is suitable. Sometimes it is possible to devote a spare room or a large closet to housing an iguana. Particularly for the bigger lizards the cage design should be vertical, rather than horizontal, as



iguanas like to be able to climb and 10000000 branches. Diagonal and horizontal perches are recommended, and these should be at least the diameter of the iguana's body. For a large iguana, an enclosure of at least 8x4x8 feet high is recommended. The horizontal dimensions of the enclosure must be sufficient to allow the animal to stretch out and to move freely. Always provide visual barriers: reptiles do not like to live in a fish bowl. Regardless of size, an iguana's enclosure needs to meet the following criteria:

**Temperature Range:** 80-100°F (25-38.5°C) 24 hours a day.

Ideally, maintain the cage at the cooler end of this range during the night and at the warmer end during the day. This is made easier by using a thermostat. We recommend secondary or background heating of the whole cage, with a range, for example of 80-95° F, and provision of a basking or spotlight to create a "hotspot" of 95-100°F, during the day.

**Ultraviolet light source:** 10-12 hours in 24.

A regular photoperiod or day/night cycle is crucial to the mental and physical well being of reptiles. An automatic timer is recommended.

**Humidity:** 80-90% relative humidity.

A humid environment must not be achieved at the expense of good ventilation. Bathing, misting, drip systems and humidifiers can be used.

**Good ventilation:** fans such as those designed for bathrooms may be necessary in large or solid sided enclosures.

Heat sources can include heat lamps (infrared, ceramic), heat tape and under tank heaters. It also helps to keep the animal in a warm room, or one that has its own heat source. This is secondary heat. Heat must be present 24 hours a day, but white light should not be left on for more than 12 hours. It is recommended that the entire enclosure be heated to within the POTZ with, for example, a ceramic heater, which emits heat but no light, and adding a basking heat source, such as a spotlight focused on a small area, to provide an area at the upper end of the POTZ. Installing the radiant heat source (spotlight) at one end of the enclosure provides a temperature gradient. As iguanas should have approximately 12 hours of daylight and 12 hours of darkness, having the spotlight on a timer will accomplish the goals of a regular photoperiod and of decreasing the cage temperature slightly at night. **Be sure that the iguana cannot come into contact with any light or heat bulb, as he will burn himself.** Hot rocks are not recommended. These heat irregularly, and commonly cause burns. A hot rock does not heat lizards of any size adequately, and since they do not radiate heat significantly, they are not appropriate for basking lizards, such as iguanas. Iguanas have evolved to absorb heat from a radiant overhead source, such as the sun.



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No place in the cage should be cold. Sick lizards will often hide, and if the hiding spot is not within the POTZ, the animal's immune system will not function properly. Use a thermometer to check temperatures, not just in the "hotspot", but in shaded or cooler areas as well. Ideally, place several thermometers about the enclosure. Do not use your hand to estimate the temperature. Use a thermometer. A hygrometer, a device that measures humidity is another important tool. These can be bought at hardware stores.



Ultraviolet light in conjunction with an appropriate environmental temperature and diet is essential to iguanas. Ultraviolet light should be provided daily for 10-12 hours. Some lights are marketed as "full spectrum", but do not necessarily emit the correct wavelengths of light. A light should meet the following criteria: CRI (color rendering index) of 90-100, and CTI (color temperature index) of greater than 5500 K. Lights recommended include Duratest Vitalite and Vitalite Plus, Black Light Fluorescent (GE) and Reptisun and Iguana Light (Zoo-Med Laboratories). Some lights, although they meet the IN requirements, do not emit "natural looking" light. None of these lights approaches natural sunlight, in terms of the UVB output and the psychological importance of proper lighting: an individual animal may benefit from a combination of lights, and as long as the IN requirements are met, additional lights may be added to improve appetite and behavior. Since reptilian eyes may see parts of the spectrum which ~ do not, natural light may be necessary for the environment, food and other reptiles to appear as they should. Lighting may also affect the behavior of the animals and in addition to improving their psychological well being, correct light will help to display the animal at its best. Always use the longest tube light you can. A four-foot light emits more than twice the UVB rays of a two-foot light.

Ultraviolet rays do not penetrate glass or plastic, so to be useful, the light whether natural or artificial, must shine directly on the animal. For the iguana to receive the maximum benefit from his IN light, it should be fixed 18-24 inches from the basking spot. In larger enclosures, this may be managed by fixing the light vertically or by using more than one light. When the animal can be kept within the POTZ, sunlight is tremendously beneficial. When the temperature outside is appropriate (80-95° C), expose your iguana to sunlight, either through a screened window or in a secure enclosure outside (provide shade, shelter and water). Remember that to be useful in vitamin D and calcium metabolism, not only must the IN rays be present, but the animal must be within his POTZ. Be aware that reptiles, when exposed to natural sunlight will often undergo dramatic changes in behavior, become very active, and sometimes change color or become aggressive.

### **SUBSTRATE AND CLEANING**

The substrate or floor covering used in the enclosure should be safe, non-ingestible and easy to clean. Do not use corncob, cat litter, bark, and sand or gravel as these are easily swallowed and can cause an impaction or intestinal blockage. Organic substances such as corncob and shavings are excellent growth media for bacteria and fungi. These substrates may appear clean but they can hide fecal material and left over food. Dusty substrates, such as some cat litters and shavings should be avoided, as they can contribute to respiratory disease. Artificial turf (indoor/outdoor carpet) or newspaper usually makes the best substrates. Paper towel is best for very small, delicate skinned lizards. Be sure to clean and change the carpet or turf regularly, as it will eventually grow mould. Trim or flame the edges of turf to seal them, as small toes can become trapped in loops of material, and frayed edges can look remarkably like plant material, and may be consumed.



A functional, easy-to-clean cage, which meets the needs of the lizard should be the goal of the iguana keeper; the more decorative the cage, the more difficult it will be to clean, and as a result, it will be cleaned less often. Questionable or poor hygiene contributes significantly to the burden on a reptile's immune system, and a high environmental bacterial load will increase the chances of any animal developing disease. Food and water dishes should be cleaned daily and fecal material removed. Several times weekly, disinfect the dishes after washing them. Depending on the size of the cage, daily spot cleaning, weekly cleaning and monthly thorough disinfection is a minimal recommendation.

"Cleaning" can be achieved with hot soapy water or water and vinegar. Only a clean surface can be disinfected. Once a surface is clean, it can be disinfected with a non-toxic product. Avoid phenol products. A 3% bleach solution is safe and effective for most purposes. Your veterinarian likely stocks other products. No single product is ideal for every situation, and organisms can develop resistance to cleaners and disinfectants, so a rotating schedule of use is recommended. Always rinse well after cleaning and disinfecting. Be sure of good ventilation, as even low levels of "safe" products can produce fumes harmful to delicate reptile lungs.

### **Cage Furniture**

All animals need privacy and so an enclosure should include a house or hiding place. Be sure that this area is also adequately heated; a sick animal will hide and a sick reptile not kept within his POTZ will only get sicker. As wild iguanas spend a great deal of time in the trees, provide branches of at least the diameter of the iguana's body. Fixed platforms are also useful, and "hammocks" can be fashioned for some lizards. If the iguana is to be kept in a tank, it is important that the glass not be uncovered on all four sides. As a prey species, iguanas need to feel safe, not exposed, as living in a fish bowl. Use plastic vines, safe plants, branches, aquarium backing and cage furniture to provide visual barriers. Do not use mirrors in the cage, as the appearance of "another iguana" will be stressful to your pet.

### **Diet and Supplementation**

Our understanding of the iguana's nutritional requirements has changed considerably over the last ten to fifteen years. Current studies will likely lead to further modification of our recommendations: the precise nutritional requirements of the green iguana are not known. For this reason, one must adhere to certain principles based on their known biology when feeding iguanas, and a single commercial or restricted home made diet can be dangerous. Iguanas are true herbivores, more specifically; they are folivores (leaf eaters). Although their requirements change slightly as they age, the bulk of their diet should always be dark leafy greens, high in calcium and high in fiber. Since we cannot offer the leaves found in the iguana's natural environment, every effort must be made to select from what is available, as wide a variety as possible of foods of the highest nutritional quality. What follows are recommendations based on clinical experience, common sense and sound research:

- 80-95% dark leafy green plant material
- 5-20% other vegetable material
- No more than 5% of the diet should be fruit, as it is low in calcium and high in energy (if offered high calorie foods, iguanas eating to meet their energy requirements may not eat enough to meet their other requirements, such as for calcium)



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- No more than 20% of the diet should be protein (no animal protein)



As iguanas age, their protein requirements decrease. The following is a guideline for healthy iguanas, growing normally:

- Up to 12-18 months old; usually less than 30 cm. nose to vent: 15-20% protein; feed hatchling iguanas twice daily and juvenile lizards daily. A variety of healthy foods, appropriately high in calcium are crucial if Metabolic Bone Disease is to be avoided (see the related article).
- 12-24 months old; snout to vent length usually 30-45 cm: feed adolescent iguanas daily, but decrease protein to 10-15%
- Over two years old; snout to vent length usually greater than 45 cm: mature iguanas can be fed daily or every other day, with less than 10% protein (it may be easiest to offer protein just once a week). Obesity is a common problem for captive animals that do not have to move more than a few feet to find an abundance of food.

Animal protein is never appropriate for iguanas, as they cannot digest it properly and it can lead to serious nutritional deficiencies and toxicities: meat products are often high in fat, vitamin D and phosphorus and low in calcium. Cat food, dog food, other meats and monkey chow should never pass green lips! See the Metabolic Bone Disease article for more information.

Use vitamin and mineral supplements cautiously, as there is a very real risk of overdosing vitamins A and D. Remember that supplementation will not compensate for a poor diet. A multivitamin/mineral supplement designed for humans or for reptiles can be given weekly to young iguanas, every two weeks to adolescent iguanas and monthly to mature iguanas. In addition, a calcium carbonate or calcium gluconate supplement, containing no vitamin D or phosphorus (purchased from a pharmacy) is recommended every two to three days for young lizards, every three to four days for adolescent lizards and weekly for mature animals. It is a good idea to discuss the topic of supplementation with your veterinarian, in light of the rest of the iguana's diet and his health status. The following are suggested food sources for iguanas. Every effort should be made to offer foods high in calcium as the bulk of the diet, and at least two of these should be included in every feeding. A variety of other foods in the proportions discussed above, should also be provided. Foodstuffs should be washed, mixed, and if the lizard is a picky eater, should be chopped as finely as necessary (or ran through a food processor) to ensure that he does not eat just his favorite things. In the case of young lizards, offer a variety of foods from the beginning, to develop healthy eating habits.

**Suggested vegetable sources that are relatively high in calcium include:** dandelion flowers and greens, beet, mustard, collard or turnip tops and greens, alfalfa pellets or grass, timothy hay, Swiss chard, escarole, parsley, spinach, romaine lettuce, broccoli leaves (not florets), cilantro, hibiscus and mulberry leaves, and Chinese greens.

**Suggested vegetable sources that are lower in calcium include:** hibiscus, nasturtium, rose and carnation and other edible flowers (be sure that these have not been treated with artificial colors or pesticides), mulberry leaves, clover, watercress, Savoy cabbage, kohlrabi, sprouts, asparagus, peppers, sweet potato (cooked), kale, carrot, squash, bok choy, corn, thawed frozen vegetables.



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**Suggested fruits include:** figs, grapes, papaya, raspberries, mango (these fruits are relatively high in calcium as compared to the others), melon, apricot, dates, peaches, prunes, raisins, berries, pears, plums, kiwi, apple, and banana-with skin.

**Note:** Grapes, banana, spinach, beets, cabbages, brussel sprouts, broccoli, bok choy, kale and cauliflower should be fed in moderation as they can interfere with calcium metabolism.

**Suggested protein, grain and fiber sources include:** soaked dry legumes (kidney, navy, mung beans, etc.), commercial reptile diets, natural bran cereals and whole grain breads.

**Note:** Tofu is high in plant fat, and so should be fed in moderation, if at all.

Commercial diets are a convenient option when feeding iguanas, but it must be emphasized that these diets are a relatively recent creation, and are subject to minimal regulations with respect to content. Food colorings, preservatives and many other ingredients would never cross an iguana's path in the jungle, and so it is recommended that none of these diets form the majority of the diet until further research has

#### BIOLOGICAL DATA

**Incubation Period for Eggs:** 73-93 days

**Possible Lifespan:** 13-29 years

**Size:** males can reach six feet in length from snout to tail tip

**Sexing:** can be difficult in the case of juveniles, but with experience, mature iguanas can be sexed visually. Males are generally larger, and often turn slightly orange with age. They have taller dorsal spines (those on the back of the neck), larger femoral pores on the inner thigh (these excrete a waxy substance), and a larger dewlap and opercular scale (the big single scale at the angle of the jaw). The pores, dorsal spines and opercula scales are relatively smaller in females, and they generally appear more feminine and delicate.