

Iguana: Husbandry, Nutrition and Disease

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The green iguana (*Iguana iguana*) has a natural range from Mexico through Central and South America. It is arboreal, diurnal, mainly folivorous, and solitary except during breeding season. These characteristics make iguanas, though one of the most popular pet reptiles, one of the more difficult to properly keep in captivity.

Being arboreal, iguanas are most comfortable at a high elevation. Keeping iguanas in aquariums or cages at low heights, especially if they are not adapted to human contact, is stressful. Constructing an enclosure that allows the iguana to ascend branches vertically and rest at a height of over six feet is preferred. The rostral (nose) abrasions from constant attempts to escape from wire cages will often be prevented once the iguana is supplied with a means to attain a safe and secure height. This may be a difficult requirement for the average pet iguana owner to accept and accomplish.

Iguanas spend most of their time during the day basking in full or partial sun. When they eat they tend to eat rapidly and then return to basking. They are hind-gut fermenters, and require that their body temperatures be high, probably between 36 – 37° C (about 97 – 98° F) for effective digestion. Exposure to sunlight also allows sufficient vitamin D absorption for proper calcium balance. In captivity, maintaining this temperature at a location in the enclosure that is psychologically comfortable for them to occupy is important in their ability to digest food. In other words, it does not do any good for the temperature to be at 98° in a place in the cage where the iguana refuses to sit. Creating a temperature gradient throughout the cage so the iguana can regulate its body temperature is optimal, but if it prefers a location where the temperature never exceeds 78

degrees, digestion will suffer. This leads us into one of the most controversial and important aspects of husbandry, the folivorous nature of these animals.

When iguanas were first kept as pets it became apparent that an iceberg lettuce diet was not sufficient for proper health and growth. It was then suggested that young iguanas have a high consumption of animal protein in the form of insects and possibly carrion. This “fact” was carried through the literature and many books found in pet stores still recommend that young iguana’s diets contain insects, dog or cat food, and live prey such as pinkies. When these animals are young and this diet is fed, no obvious adverse effects are immediately noted. In fact, these iguanas often grow extremely rapidly and have a healthy appearance, which led owners, herpetoculturists and veterinarians to assume that this diet was suitable. It was not until these animals reached three to six years of age that the renal (kidney) failure caused by this diet became apparent. The state of chronic dehydration that most indoor iguanas experience (due to the relative humidity indoors being much lower than the 80-90% humidity found in their natural habitat), is thought to also contribute to kidney disease.

More recent studies of the diets of young iguanas in the wild have shown that little if any animal protein is ingested by neonatal or juvenile green iguanas. An occasional insect is devoured, but these may be occupants of the foliage or fruit that the animal is actually consuming. Fruits and high calorie content vegetables are consumed in small amounts – hence the term folivorous rather than herbivorous.

The solitary nature of these animals is also an issue in captivity. As juveniles they are often tolerant of one another. The fact that they “stack” on top of each other in their enclosure is often interpreted by the owner as a sign that they enjoy each other’s company. Actually, they tolerate and are indifferent to one another, until one of them becomes sexually mature (although even when young, their sharp

claws may cause punctures of the skin and subsequent abscesses in their cagemates).

Owners are shocked to find iguanas that have cohabitated for months to years suddenly fighting when one becomes sexually mature. Iguanas can inflict serious wounds within a matter of minutes. It is preferable to house multiple iguanas separately once they have reached the age of two or three years, or a length of over 28 cm.

Metabolic bone disease (MBD)

The lack of natural sunlight with its vitamin D3 inhibits the iguana's absorption of calcium. The provision of UVB spectrum artificial lights may be sufficient for some iguanas and is definitely recommended if the iguana must be housed indoors. Several factors may contribute to the development of MBD even when the owner is providing "proper" artificial lighting:

- Artificial lights often do not provide the amount and/or width of spectrum present in natural sunlight.
- Artificial lights lose their UV spectrum while still emitting visible light. Artificial UV lights need to be replaced at frequent intervals (9-18 months).
- Iguanas in larger enclosures, or those that roam free in the house for long periods of time, may not have close enough contact with the light source to absorb the UV rays. It is generally recommended that they be within 18-24 inches of the light for effective absorption of the rays.
- The UV light provided by owners is often filtered through plastic or glass, which removes most of the useful spectrum.
- The diet may be deficient in calcium, or incorrect in the calcium phosphorous balance.

A young iguana with MBD will generally have one or more of the following clinical signs:

1. pathologic fractures of one or more long bones, with the accompanying soft tissue swelling that is classic of these fractures,
2. softening of the mandible and maxilla ("rubber jaw"),
3. paresis or paralysis of the rear leg,

4. inability to urinate and/or defecate (both three and four above being caused by pathologic spinal or pelvic fractures),
5. muscle fasciculations (especially toe twitching),
6. anorexia,
7. eventual death.

Most young MBD iguanas that are still eating will respond well to veterinary therapy and improved husbandry. Those that have become severely anorexic, emaciated or depressed have a more guarded prognosis. Owners should be forewarned that even during treatment and after the husbandry has been corrected, additional pathological fractures may occur before mineralization of the bone has been re-established. The long bones tend to remodel well, but the mandibular and maxillary (jaw) deformities may persist for long periods and even worsen with time, as one jaw, usually the maxilla, grows longer than the other. MBD may also cause a progressive scoliosis and kinking of the spine and tail that can worsen with time despite restoration of the calcium balance.

Prevention and long-term treatment begin with improved husbandry and diet.

For more information on iguana diet, see www.anapsid.org/iguana/igdiet.html.

Thermal Burns

Hot rocks with focal “hot spots,” heating pads in the cage or lights shining on the dorsum of the animal, cause most thermal burns in iguanas. Generally the more severe burns are seen in one of two situations:

- Iguanas kept in a cool (outdoor) environment, where the owner attempts to compensate by adding sources of light or heaters. The iguana then comes in close proximity to the heat source as its body temperature becomes extremely low. The iguana’s receptors and reaction times to heat are greatly slowed by the suboptimal core body temperature.
- Debilitated animals, where their illness prevents them from moving away from the heat – either due to decreased perception of heat or decreased ability to react to that perception. Treatment will vary according to the severity and extent of the burns.

Gravid (with eggs) female iguanas

The classic time for presentation is from November through June (though this can vary in totally indoor iguanas). The female may or may not have exposure to a male, since being gravid is, as in avian species, simply ovulation. Typically the owner will report an initial restlessness, irritability or hyperactivity, often accompanied with or followed by decreased appetite, possible lethargy and an enlarging abdomen. These follicles (initially), or eggs (when they leave the ovary and head down the oviduct) are often readily visible and palpable through the abdominal wall. The question is when to intervene. There is no absolute answer, but some guidelines will help. Generally, if the radiographs show that the female has ovulated and she demonstrates greatly reduced appetite with no interest in the nesting location provided to her for more than two to three weeks, then intervention should be considered. Follicles still on the ovary can occupy the entire abdomen both radiographically and on palpation. Ideally blood chemistries and a CBC will be done, to determine if the calcium is adequate for egg laying, and rule out any concurrent infection. If attempts at induction of egg laying are not successful, and supportive care (fluids, tube feeding and calcium) for another week or two still fail to induce oviposition, then it may be time to perform an ovariohysterectomy (spay).

Renal failure

As discussed earlier, this is a heartbreaking and often acute disease of large, strong, apparently healthy adult iguanas. What combination of excessive protein intake, dehydration, parenteral vitamin D3 administration, visceral gout and bacterial glomerulonephritis are involved in this syndrome is yet to be defined. Most of these iguanas present with a past history of rapid growth and strength, and a significant animal protein intake. Often the kidneys, which should lie within the pelvic inlet, have become large, palpable and painful masses hanging down within the abdominal cavity. Blood chemistries generally show an increased phosphorous, anywhere from a mild increase of seven to eight mg/dl, to 40mg/dl or greater. A lower than normal calcium is often noted. The uric acid tends to remain normal except in the most terminal cases. Many of these iguanas present

acutely ill, with scleral injection (probably due to blood pressure changes associated with the renal shutdown and hypertension) and pharyngeal edema, which may cause difficulty swallowing. When parenteral fluid is administered and the renal function is severely compromised, pharyngeal and soft tissue edema may worsen from retention of fluids. CBCs should always be run concurrently with the serum chemistry since active glomerulonephritis is a distinct possibility and treatment of the underlying infection may be critical. Electrolytes should be included in the chemistry panel to allow proper selection of fluids. Often, a renal biopsy will help with both treatment and prognosis.

Cystic Calculi

Very large bladder stones are commonly encountered in iguanas. They (the iguanas) often present with blood in the urine, straining to urinate or as an incidental finding by the owner or examining veterinarian on palpation. These stones may have a classic multi-layered concentric ring appearance on radiographs. Their composition is usually calcium urate. Correcting any dietary or metabolic disturbances may help prevent the recurrence of these stones. Also, dehydration may play a part in their formation. These stones should be cultured during cystotomy.

***Salmonella* and zoonotic concerns**

Many articles have been written concerning the danger of salmonellosis being transmitted to humans from reptiles. Though a high percentage of reptiles may carry *Salmonella*, unless the hygiene is poor or the animal is stressed, the *Salmonella* many never become clinical, contagious or detectable by culture. However, households with children and immune compromised individuals must be warned of the increased risk of keeping reptiles due to this potential. For more information on this subject, speak to the veterinarian who is treating your pet.