

COMMON MALNUTRITION ISSUES OF BIRDS AND REPTILES

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Unfortunately, nutritional deficiencies in captive exotic pets are still common. In some cases, this reflects our lack of understanding of the complex lives and nutritional needs of these animals in the wild. In other instances, however, nutritional requirements are known but this knowledge is not available to owners, or balanced diets are not convenient for owners to use. This presentation aims to outline common nutritional disorders of exotic pets and how to both educate the owner on diet needs and convenient forms of making balanced diets available to their pets.

We must also take into consideration that nutritional needs vary with life stage (e.g., growth, reproduction) and that feeding is both an important component of the human–animal bond and a constituent of the psychological well being of all animals.

BIRDS

Our knowledge of avian nutrition is constantly evolving. We now understand that the popular seed diets marketed for psittacines are likely to lead to nutritional deficiencies. Some seed diets do have ‘balanced’ components; however, what birds are offered and what they consume are often two different issues. In general, seed diets tend to be high in fat and low in vitamins. Therefore, it is not uncommon for the clinician to examine birds that are of normal body weight, or more commonly, overweight, but who might be deficient of a variety of nutrients. Obesity is a major problem in psittacine pets fed diets high in fat and who experience little exercise on a daily basis. Adult birds are difficult to convert from seed diets; therefore, a group-specific balanced diet of pellets should be offered to all exotic birds as chicks. Growing birds require at least 20% protein and 0.9% calcium of the dry weight of a diet. Owners raising young birds should be advised to purchase a gram scale (accurate to nearest gram) and weigh their birds at the same time of the day on a daily basis. Growth curves for a variety of psittacines are available.

Vitamin A is associated with the differentiation of epithelial cells and immune system response to bacterial infections. Vitamin A deficiencies in birds are commonly associated with poor development of epithelial cells and thus can present as sinus infections, blunted choanal papillae, and poor skin condition. Experimentally, chickens fed diets with adequate levels of Vitamin A resisted infections better than those fed diets low in Vitamin A. The requirement of Vitamin C in the diets of some birds has been demonstrated. However, the exact requirement of all pet species is unknown. Gout has been associated with diets high in protein; however,

kidney disease is at the root of this disorder. Liver “disease” has also been implicated with poor diets; however, scientific studies which demonstrate a direct relationship are lacking.

Years of avian nutrition have now led to reputable balanced, pelleted diets which have proven success from growing chicks to reproductively active hens. In the author’s opinion, there are two main reasons why these diets are not utilized routinely. Most of these diets are not commercially available, reducing owner compliance. Avian practitioners should either stock balanced pelleted diets or help owners to order these diets directly. The second reason has to do with bird acceptance. As mentioned previously, feeding is an important part of the psychological well being of most animals. In the wild, psittacines spend hours foraging. They often “taste and drop” a variety of foods. For example, a flock of scarlet macaws may descend upon a beach almond tree and pluck almonds, chewing small amounts of the ripest almond flesh, consuming some of the seed, eating the new growth buds, bark, and flowers. In one tree alone, they will consume different portions of the plant (with different nutritional components), practice dexterity, agility, and play before flying to the next tree. It is difficult to pretend that extruded pellets can satisfy these complex natural behaviors and thus owners should be advised to offer fresh vegetables/fruits/nuts in creative ways that will allow this expression *without sacrificing the balance of the diet*.

REPTILES

This article cannot discuss the nutritional needs of the approximately 6,000 species of reptiles; however, some disorders have been directly associated with nutritional deficiencies. Secondary nutritional hyperparathyroidism is still prevalent in reptile pets. It is caused by a chronic deficiency of calcium. This, in turn, is caused by either the ingestion of compounds that prevent the absorption of calcium (oxalates), a vitamin D3 deficiency (as vitamin D3 is needed for the bioavailability of calcium), or an improper calcium:phosphorus ratio, as phosphorus competes with calcium for binding and absorption in the intestines. This disorder is characterized by a wide range of clinical signs depending upon its severity and chronicity, as well as the physiologic stage of the animal affected. It can manifest as pathologic fractures, fibrous osteodystrophy, stunted growth, or hypocalcemic tetany. Most commonly, this disease is caused by a chronic deficiency of vitamin D3 (1,25-dihydroxycolecalciferol). This vitamin is formed when a cholesterol derivative is converted to colecalciferol in the skin in the presence of ultraviolet light, then transported to the liver where it is hydroxylated into 25-hydroxycolecalciferol, and again transported to the kidney where it is hydroxylated into 1,25-hydroxycolecalciferol. Vitamin D contained in plant material is vitamin D2, which needs to be converted in order to be utilized. Current studies provide contradicting information about whether reptiles fed active vitamin D3 are able to utilize it and whether oral supplementation is effective and without negative side effects. Therefore, the primary requirement of vitamin D3 in reptiles should

be managed in its “natural” form, which is to provide a reptile an adequate source of ultraviolet light (290–300 nm in wavelength).

Common nutritional-related disorders in carnivorous and omnivorous reptiles include deficiencies of calcium and vitamin A from feeding poorly supplemented invertebrates and muscle meat (instead of whole prey), and vitamin E and thiamin deficiencies from feeding fish that contain high levels of polyunsaturated fatty acids or thiaminases. Vitamin A deficiency can manifest as squamous metaplasia, which can lead to the formation of ear abscesses in chelonians and stomatitis in other species. Vitamin E deficiency has been associated with steatitis in snakes fed obese rats. Thiamine deficiency is most commonly associated with neurologic signs. For example, garter snakes fed frozen fish have been described to lose their righting reflex and lay in dorsal recumbency. Practitioners are advised to provide owners with a handout on the “Proper Care and Handling of Frozen Prey” to eliminate these problems, or advise owners on how to supplement prey with vitamin B and E. Spontaneous splitting of the skin associated with a possible vitamin C deficiency has been described in boids. Aside from those examples, pets fed whole prey are less likely to develop nutritional problems *as long as the prey they consume have been adequately fed balanced diets*. In the case of insectivorous reptiles, the insect prey should be fed a complete diet to “gut load” them before feeding them and should be dusted with both a calcium and vitamin and mineral supplement. Generally, calcium supplementation for insects can be provided daily for young growing reptiles, and three or four times weekly for adults. Multivitamin supplements should be used less frequently—generally once or twice weekly for juveniles or every other week in mature animals.

Species that are most likely to develop nutritional problems are those which are true herbivores (green iguanas) or omnivores (bearded dragons, water dragons, box turtles). Long-term effects of balanced pelleted diets for reptiles have not been published. Therefore, in the case of herbivorous or omnivorous reptiles, the practitioner should provide the owner with a convenient system to feed balanced “homemade” diets. In the author’s experience, providing the client with 3–4 recipes to follow is most useful. One can advise the client to make up a large batch of “iguana salad” once per week and package it in smaller ziplock bags for daily use.

Underfeeding and obesity are unfortunately common problems in reptiles. Underfeeding is often a result of the owner’s unfamiliarity with either the type of food or the frequency of feeding of the pet. A consultation that includes a thorough history and husbandry of the pet will elucidate these issues. The author finds it useful to show owners a photo (available on the internet) of the pet at hand in the wild. This “reshapes” the way an owner thinks of their pet from a “cage bound” animal fed dead prey to one that is actively foraging in its natural environment. Obesity is prevalent in monitors, snakes and other carnivorous animals that are fed whole prey but rarely exercise to their full potential. Animal keepers should be advised on the minimum caging requirements and in creative ways to provide exercise for these unusual animals.

Chronic dehydration is also a nutritional problem for many reptiles, often leading to kidney disease or other metabolic problems. Water is often either not offered (as keepers do not perceive that their animals need it, as they do not visualize them “drinking”) or offered in ways that are inappropriate for the species at hand. Some species, like chameleon, will only drink by licking water off leaves and thus benefit from drip systems or continuous misters. Others, like snakes, are more apt to drink while soaking in shallow dishes.