Nutritional Support of Reptile Patients

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KEYWORDS

• Reptile • Nutrition • Assist feeding • Nutritional support • Neonates

KEY POINTS

- Nutritional support is a very important, though often neglected, factor in the management of sick and anorexic reptiles.
- Reptiles can benefit greatly from receiving appropriate nutritional support in a timely manner.
- A basic understanding of reptilian metabolism, digestive physiology, and the natural history of commonly encountered species can help the clinician make sensible recommendations for the maintenance of healthy animals and appropriate intervention in the case of ill animals.

INTRODUCTION

One of the most amazing characteristics of ectothermic animals is their gastrointestinal physiology and ability to efficiently process calories. Similarly sized mammals and reptiles use dramatically discordant amounts of calories and nutrients to function and grow. Though it is difficult to make broad statements regarding such huge and varied taxa, a generally accepted rule of thumb is that reptiles have approximately one-tenth of the energy requirements of a comparably sized mammal.[1,2] Because of the unique reptilian gastrointestinal physiology and energy metabolism, veterinarians are often confused about how to approach the nutritional support of ill reptiles. Many veterinarians and reptile keepers think that because reptiles in health do not eat as frequently as mammals or birds they can withstand the same kind of fasting intervals when clinically ill. Therefore, the tendency can be to allow ill reptiles to go considerable lengths of time before nutritional support is instituted. In many cases, short intervals of anorexia are not clinically important to the reptile but, in other cases, effective nutritional support can be the deciding factor as to whether or not treatment is successful.

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Veterinarians will often recommend convalescing reptiles be kept at temperatures in the upper range of their preferred optimal temperature zone (POTZ) to increase their metabolic rate and speed healing.[3,4] The elevation in body temperature and metabolic rate associated with healing or recovery from illness increases the reptile patient's caloric needs independent of any other factors affecting the animal. Therefore, it is possible for reptile patients to develop a catabolic state when environmental temperatures are elevated and caloric intake does not address the increased needs.[5] This same issue can occur with healthy reptiles that are kept inappropriately warm without adequate caloric intake or which are not allowed to properly thermoregulate; however, the problem can become exacerbated with ill or injured animals.

Another important factor to consider in providing nutritional support is the effect digestion can have on metabolism in reptile patients. In several reptile species, researchers have documented what is referred to as specific dynamic action (SDA).[6] SDA is defined as an increase in metabolism caused by the ingestion of food, especially proteins, and is ubiquitous across a wide variety of animal taxa. In a study using pythons *(Python regius* and *P molurus*) ingestion of amino acids independent of body temperature resulted in a postprandial rise in oxygen consumption, heart rate, and growth of visceral organs,[7] which is representative of what has been seen in other vertebrate species. Thus, to maximize the metabolic rate and speed healing, reptiles should be given access to temperatures in the upper end of their POTZ and be fed adequately. Meal composition has an effect on SDA in reptiles, with meals having "complete" amino acid profiles (as found in whole vertebrate prey items) eliciting maximal effect compared with diets deficient in some amino acids. Fats and carbohydrates do not elicit SDA in reptiles.[8]

Though references exist regarding reptile nutrition, there is little solid research to guide the clinician when it comes to nutritional support of the reptile patient.[5] Therefore, much of what is presented in this article, though based on scientific fact, is anecdotal and it should be applied at the clinician's discretion according to details of the particular case.

Throughout this article, when referring to the feeding of whole prey items, it is assumed that the prey is prekilled unless otherwise specified.

CHOICE OF FOOD FOR ASSIST FEEDING

In most cases, unless there are specific contraindications, the animal's regular diet can be used for assist feeding. Many lizards and chelonians that are acclimated to people will readily accept hand feeding when they would otherwise refuse to eat. The author has seen several bearded dragons *(Pogona vitticeps*) and green iguanas (*Iguana iguana*) that become habituated to hand feeding and will refuse to eat food not presented by hand. Some anorexic reptiles (including snakes) will swallow a food item after it has been introduced into their mouths. One of the keys to success with this method in snakes is to hook the snake's teeth into the rodent so it is difficult for them to spit it out. This technique is described in further detail in the section on nutritional management of neonatal reptiles.

If the animal cannot or will not tolerate assist feeding with whole, natural food items, those food items can be liquefied in a blender or food processor and administered via gavage or an indwelling feeding tube. It may be necessary to dilute the resultant mixture so it will pass through an appropriately sized feeding tube. The author will often administer oral fluids as part of the treatment protocol, so the benefit of diluting food mixtures can be two-fold.