Chameleons: Signs, Treatment, and Prevention of Vitamin A Deficiencies

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What is vitamin A?

Vitamin A is a fat soluble vitamin, and can be stored in fatty tissues in the body. Vitamin A is required for healthy skin, mucous membranes, the retina of the eye, muscles, teeth, and other tissues. It is necessary for proper growth, reproduction, and a properly functioning immune system. Some forms of vitamin A also have antioxidant properties. It is an essential nutrient, meaning it must be included in the diet.

What are the forms of vitamin A?

There are several forms of vitamin A. Beta-carotene is a form commonly found in vegetables. Many animals can convert beta-carotene into vitamin A. Others, such as the cat, cannot, and must have what is commonly referred to as preformed vitamin A. It was originally thought that chameleons could convert beta-carotene, but recent research suggests that they too may need preformed vitamin A.

There has been considerable controversy over how much, and what type of vitamin A chameleons need. Reports of small research studies in the 1990s suggested chameleons should not be given preformed vitamin A, since it could result in excessive levels of vitamin A in the animal (hypervitaminosis A). Later research found this information to be incorrect. Many chameleons today suffer from vitamin A deficiency (hypovitaminosis A) due to the misinformation published in the early 1990s.

What are the signs of vitamin A abnormalities?

Hypovitaminosis A	Hypervitaminosis A
• Reduced growth rate • Death • Metabolic bone disease • Necrosis/sloughing of the tip of the tail • Swollen lips • Swelling around the eyes • Abnormal vertebrae • Difficulty with maintaining a grip or posture • Increased number of upper respiratory infections • Inability to reproduce or death of eggs • Loss of appetite • Skin abnormalities • Hemipenile impactions in young males	• Loss of appetite • Liver enlargement • Bone abnormalities • Calcium deposits in soft tissues • Skin abnormalities

Why are pet chameleons susceptible to vitamin A deficiency?

Chameleons kept as pets often have a diet that primarily consists of insects. In many cases, insects purchased for feeding have not been fed properly and have poor vitamin A levels. In the wild, chameleons also eat small lizards and birds as part of their diet. These species, because of the vegetable matter in their stomach and intestines, provide much higher levels of vitamin A. In addition, the insects they feed on have generally not been nutritionally deprived, as are some purchased insects.

How are chameleons with vitamin A abnormalities treated?

Hypovitaminosis A is treated by giving oral or injectable vitamin A. The husbandry and nutrition must be corrected to prevent recurrence. Secondary problems such as infections also need to be treated. Animals with severe deficiencies may have permanent problems such as skeletal abnormalities, eye disease, or impaired respiration.

The basic treatment of hypervitaminosis A is to remove the supplemental source of vitamin A. Secondary problems such as

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liver toxicity or skin abnormalities will also need to be treated.

How should chameleons be fed?

In the wild, chameleons eat a wide variety of insects. As pets, they are generally fed crickets, mealworms, and wax worms. Feeder insects should be coated with calcium supplement (powdered calcium carbonate or calcium gluconate) twice a week for adult Veiled Chameleons; every day for juveniles. The insects should also be "gut-loaded," which means the insects are fed nutritious and vitamin-rich foods before they are given to the chameleon.

Vitamin Rich Foods to Feed Insects	
• apples	• ground legumes
• broccoli	• mustard greens
• carrots	• oranges
• cereals	• rolled oats
• collard greens	• spinach
• corn meal	• sweet potatoes

There are also commercial products rich in calcium and vitamins that can be fed to the insects. There are entire books and manuals on the subject of properly feeding prey insects for pet reptiles. Try to become as knowledgeable as possible regarding the housing and caring for prey insects. It is time-consuming and may be more expensive, but it will help your chameleon live a longer and healthier life.

If the insects are gut-loaded properly, additional vitamin supplementation is often not necessary. Because the amount of food these insects eat cannot always readily be determined, some veterinarians prefer adding a dietary supplement, especially to breeding animals. Others recommend supplementing adults once a week, and juveniles every other feeding. Specific recommendations vary with the species, age, and if the animal is breeding, so a veterinarian knowledgeable about herps should be consulted.

Feed as varied a diet as possible. In general, the more variety, the less likely a nutritional deficiency or excess will occur. Insects may be purchased or wild-caught (without the use of pesticides). Live, wild-caught insects can provide interest, mental and physical stimulation, as well as good nutrition.

Do NOT feed fireflies; they have been shown to be toxic to some animals.

Good Foods to Feed Chameleons	
• Caterpillars	• Grasshoppers
• Cicadas	• Mealworms
• Cockroaches	• Pinkie mice
• Crickets – no more than 50% of diet	• Silkworms and silkmoths
• Earthworms	• Walking sticks
• Flies	• Wax moths
• Grain beetles	• Wax worms – high in fat, so feed sparingly

The chameleon should be fed by placing the insects in a small bowl. After feeding, check that none of the insects escaped and fouled the water supply in the cage.

Some Veiled Chameleons also appreciate a small amount of plant material in their diet. Clip mustard or collard greens to the side of the cage, and spray them with water.

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