

Vitamin A Deficiency: Signs, Diagnosis, Treatment, and Prevention in Turtles

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Vitamin A is one of the fat-soluble vitamins. It is an antioxidant, helps in the growth and repair of tissues, and is important for proper functioning of the eyes, skin, mucous membranes, and ducts (small tubes which carry fluid from one tissue to another). A condition termed "squamous metaplasia" occurs in vitamin A deficiency, which results in a thickening of the lining of ducts, often blocking the flow of fluid through the ducts. This is most common in the tear ducts, and ducts in the pancreas and kidneys. A deficiency in vitamin A, called "hypovitaminosis A," is common in aquatic and hatchling turtles fed inadequate diets.

What nutritional problems are associated with hypovitaminosis A?

Vitamin A is present in high quantities in green leafy vegetables (especially dandelion greens), yellow and orange vegetables such as carrots and yellow squash, whole fish, and liver. Turtles fed iceberg lettuce, an all meat diet, or a poor quality commercial diet are prone to develop a vitamin A deficiency, since these foods have very low levels of this vitamin. Hatchling turtles fed high protein diets are also at risk of developing a deficiency.

What are the signs of hypovitaminosis A in turtles?

Signs of hypovitaminosis A include:

- Swollen eyelids
- Loss of appetite and weight
- Raw skin with secondary [bacterial infections](#)
- Nasal discharge (runny nose)
- [Necrotic stomatitis](#)
- Abnormal development of the eyes in embryos

The most characteristic sign of vitamin A deficiency in turtles is swollen eyelids. Often, the swelling is so severe, the eyes cannot be opened. This swelling is also a common sign of bacterial infection of the eyes or respiratory tract, or a result of eye irritation from dirty or dusty shavings. Therefore, a definitive diagnosis must be made before any treatment is started.

In severe cases, the pancreas, liver, and kidneys could also be affected.

How is hypovitaminosis A diagnosed?

The history of the nutrition and husbandry of the turtle is very important in making a diagnosis of hypovitaminosis A. The veterinarian will need to know what the turtle has been and is presently being fed, including any supplements.

The species of turtle, signs of disease, and physical examination will also provide valuable information. Other causes of the signs, such as infections, need to be ruled out. The severity of the tissue injury will be evaluated such as the presence of corneal ulcers, pneumonia, or secondary infections. Laboratory tests such as a [chemistry panel](#) and [complete blood count \(CBC\)](#) will help determine the health of the internal organs such as liver and kidneys. A [bacterial culture and sensitivity](#) and/or biopsy of lesions may also be performed.

How is hypovitaminosis A treated?

The key to treatment is providing a [nutritionally balanced diet](#), developed specifically for the species of turtle, taking into account whether it is a carnivore or herbivore. Vitamin A supplements will usually be given orally (the preferred method) or by injection (if the condition is severe) until proper levels in the body are restored. Turtles with a vitamin A deficiency are often deficient in other nutrients as well, such as vitamin E and zinc, so these nutritional imbalances need to be corrected as well. Care must be taken to not oversupplement, since vitamin A toxicities can occur. Follow your veterinarian's directions carefully. If feeding commercial diets, such as trout food, it should be fresh, and of high quality.

Foods High in Vitamin A	Foods Very Low in Vitamin A
Apricots Broccoli leaves and flowerets Cantaloupe Carrots Collard greens Dandelion greens (beware of lawn treatments) Kale Mango Mustard greens Nectarines Papaya Parsley Peaches Sweet potatoes Spinach Turnip greens Yellow squash Liver Whole fish	Apples Bananas Corn Grapes Lettuce Oranges Summer squash White potatoes

Secondary bacterial or fungal infections will be treated with antibiotics orally, by injection, or applied to the skin or eyes.

Any poor husbandry conditions will need to be addressed such as type of shavings or inadequate sanitation.

Summary

Hypovitaminosis A is a totally preventable disease. Feeding the appropriate diet will assure your turtle is going to receive the daily requirements of vitamin A. The earlier a case of hypovitaminosis A is diagnosed, the faster the response to treatment and the less likelihood of permanent damage. If your turtle is showing signs of illness, consult your veterinarian.