

Provision of ultraviolet light for captive grey parrots

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In the wild state psittacine birds are normally exposed to two ultraviolet wavelengths from the sun's radiation known as UVA (315-400nm) and UVB (290-315nm). Both forms of ultraviolet radiation are vital for normal parrot behaviour and body function. When keeping a parrot in captivity the provision of both UVA and UVB radiation should be considered to recreate natural conditions.

Function of UVA in Psittacine birds

UVA is important for normal vision in birds, allowing them to visualise UV-reflective plumage. The colour vision of birds is based on absorption peaks in the green, blue red and ultraviolet regions of the spectrum. Studies in budgerigars have demonstrated that in the presence of ultraviolet light, vision may play an important role in mate and food selection in birds by revealing UV reflective plumage. This has been shown to improve mating behaviour in budgerigars thereby improving breeding results. It has been shown that 72% of parrots have UV reflective plumage so it might be expected that UVA radiation has an important role to play in breeding activities and normal behaviour in this group of birds.

Function of UVB in Psittacine birds

Birds can obtain vitamin D from their diet or by endogenous synthesis due to the action of UVB radiation on vitamin D precursors secreted onto the featherless areas of the skin. The vitamin D is formed by number of complex biochemical reactions in the bird involving the liver and kidney. Once sufficient D₃ has been formed by the action of UVB radiation additional solar radiation transforms the provitamin D₃ to two biologically inactive compounds. This explains why hypervitaminosis D has never been reported from excessive exposure to UVB light. This contrasts with hypervitaminosis D from excess dietary vitamin D, which is reported in parrots especially in macaws. It has been demonstrated that chickens require 30 minutes artificial UVB radiation when fed a vitamin D₃ deficient diet to produce enough vitamin D to prevent disorders of calcium metabolism.

Provision of UVB and UVA radiation

Exposure to direct unfiltered sunlight is the optimal way to provide UVB and UVA radiation. It should be taken into account that in northern latitudes the amount of ultraviolet radiation received by the birds would be reduced compared with their equatorial homes. The ultraviolet light required for endogenous vitamin D₃ synthesis can also be supplied using artificial lamps manufactured to provide both UVB and UVA radiation. These are commercially available, specifically designed for birds and known as full spectrum lights. The UVB radiation exposure of an individual animal depends on basking behaviour, distance from the light and the presence of UVB filters between the bird and lamp. Frequently the greatest impediment to vitamin D₃ synthesis in parrots is the barrier to UVB provided by buildings. Even light transmitting materials such as glass and most plastics do not transmit light in wavelengths below 334nm. It is a common misconception of parrots' owners that by placing the birds in a window they are providing UVB radiation. The windows will simply filter all the usable UVB from the sun's rays. The amount of UVB produced by the artificial lamps decays over a period of time so the lamps should be replaced regularly (at least every 6 months practically). The conversion of previtamin D₃ to vitamin D₃ in the skin is also known to be temperature dependent and the provision of heat may be useful in colder climates. The UVB output of most lamps is described in terms of a percentage of UVB production rather than irradiance and the author recommends a bulb that produces 2.4% UVB.