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FULL-SPECTRUM LIGHTING

by J. BeauSoleil

There's much yet to be learned about 'complete' effects of full-spectrum lighting but aviculturists who breed birds indoors without benefit of natural unfiltered sunlight, have found full-spectrum lighting to be next best to the real thing.

UV RAYS & VITAMIN D

Full-spectrum, as the name implies, has the entire spectrum of colors equivalent to natural, unfiltered noon-time sunlight. This broad range of colors includes the all-important ultraviolet rays not found in regular fluorescent lighting.

Ultraviolet rays (both UVA and UVB) absorbed by the bird are necessary to convert Vitamin D to its "active form" which then enables it to be utilized. Without UV's, the bird cannot properly process Vitamin D, becomes deficient and may develop rickets. And without the activated Vitamin D, the bird is unable to absorb calcium which can result in soft bone tissue, skeleton and beak deformatives, particularly in very young birds.

So this means a bird can be fed a highly-nutritious, well-balanced diet but without the benefit of UVs to convert Vitamin D (esp D3), the bird is unable to assimilate these important nutrients.

(Some mistakenly believe adding more Vitamin D to diet through supplements will solve this problem, but D3 can be toxic when given in excess.)

Since full-spectrum lighting makes it possible to absorb & utilize nutrients, it stands to reason that it would also improve skin & plumage, overall wellbeing, encourage breeding behavior both nutritionally & through lengthened photoperiods. (Photoperiods means gradual increase/decrease in hours of seasonal light.)

NATURAL SUNLIGHT VERSUS FILTERD SUNLIGHT

Natural sunlight passing through glass windows filters out the important and necessary ultraviolet rays so is of little value from a nutritional standpoint. Although sunlight filtered through glass 'can' stimulate a hen into egg production, it does not allow absorption of nutrients which would ultimately affect the overall health of the hen and resulting chicks.

Plexiglass, on the other hand, allows UVA and UVB rays to pass through and can be beneficial for birds and other animals (particularly UVB for absorption of Vitamin D and D3). Many breeders are installing plexiglass windows in their aviaries to avoid using artificial lighting when sufficient sunlight is available.

LIGHT AND THE PINEAL GLAND

For a number of years Oregon Health Sciences University in Portland, Oregon has been conducting studies on the seasonal light disorder (SAD) which affects many people living in the long, dark, rainy winter months of the Pacific Northwest. They found that light therapy has drastically reduced depression along with varied health problems associated with this seasonal light disorder. Individuals participating in case studies have shown marked improvement in overall well being, increased energy, more zest for life.

In their studies, OHSU researchers have found a correlation between full-spectrum light, lengthened photoperiods, and the PINEAL GLAND, a small pinecone-shaped gland in the brain. For many years the pineal gland was theorized to be a product of evolution and served no useful purpose. However OHSU studies have found this pineal gland is very much needed to stimulate and regulate hormone secretions to keep the rest of the body functioning properly (endrocrinology). This can be compared to links of a chain.....if one link is not functioning properly, the entire chain is weakened, compromised, out of sync.

The pineal gland is found in all mammals (and birds) and is often referred to as the THIRD eye because light rays absorbed through the eyes stimulate this gland which in turn regulates the rest of the hormone secretions from other glands. Additionally they've found people who are totally blind also benefit from this light therapy, so the light is not needed as far as "seeing" but is absorbed through the optic chiasma to stimulate the pineal gland.

Since careful, long-term light therapy studies have taken place with participants at OHSU, and since all mammals and birds have a pineal gland, it stands to reason that the same effects would be true with our birds.

SUGGESTED LIGHTING METHODS
For the greatest benefits it's thought that full spectrum lighting should be within 18" above bird, at a minimum of 10 hours per day for pets and resting breeders; gradually increased over a 2 to 3 month period up to (but not exceeding) 16 hours per day for birds being brought into breeding condition. Once breeding cycle is completed, number of hours is gradually reduced back to the 10 hour minimum. These photoperiods can be regulated to correspond with either normal or during off-season by use of timers.

IN SUMMARY
From extensive research done through OHSU on human subjects, along with studies in the poultry and avicultural communities, I believe dietary deficiencies, structural deformatives, poor condition of feathers/skin (perhaps even feather plucking), weak chicks, failure to reproduce, and other health & behavioral problems are due in large part to lack of proper amounts of full spectrum lighting for our tropical equator type birds.
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Information supplied in this article is the expressed opinion of the author, who believes it to be true after extensive research.