

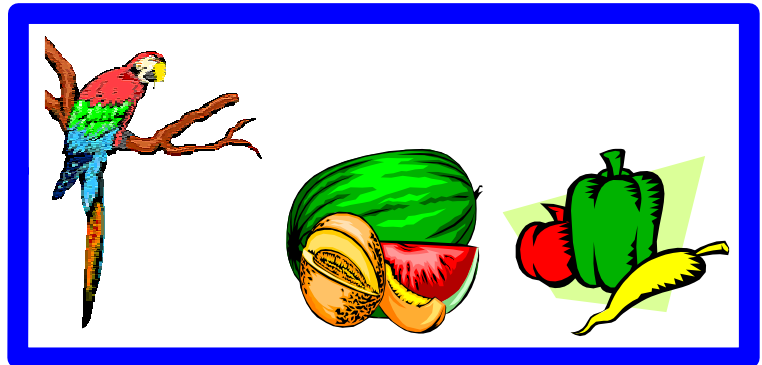
Avian Nutrition

One of the most important factors influencing the health and longevity of your bird is balanced nutrition. Coupled with proper veterinary care, mental stimulation and good husbandry, excellent nutrition positively influences all aspects of pet bird health.

Currently the Association of Avian Veterinarians and most avian nutrition experts recommend a balanced diet consisting of formulated diets (pellets), along with some seeds and foods that represent the 4 basic food groups.

Never feed your bird avocado, caffeine, chocolate or alcohol! These substances are poisonous in certain quantities. Use teflon cooking utensils with care. If burned they become highly toxic!

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Birds in the parrot family have been observed to be foragers in the wild. They will eat whatever happens to be available or in season. This includes insects, fruits, seeds, leaves, grasses, and small animals found dead or alive. Researchers have been striving to copy this natural diet for years and put it in a formulation that would prove to be complete and balanced for all birds. To date no single diet has been developed that has proven to be the perfect avian diet.

The traditional seed diet has been the cause of malnutrition and nutritional health problems. Seeds are very high in fat and low in protein, calcium and most vitamins. Therefore birds fed strictly a seed diet develop significant health problems and have shorter lives than others who are fed a proper diet. Seed may be offered as part of a balanced bird diet, but should be no more than 20% of the total diet fed.

Vegetables add bulk and roughage to a bird's diet. They need roughage to chew tear up and also to aid in the digestive process. All vegetables should be washed to remove any pesticides and harmful bacteria. A mild soap solution may be used if rinsed well. The following vegetables are considered safe and nutritious for birds:

Broccoli, lettuce (anything but iceberg which has little nutritional value), sweet potato, cauliflower, white potatoes, squash, melon (avoid cantaloupe rind and honeydew rind and seeds), tomato (avoid the leaves), beets, carrots (whole plant is OK), corn (in limited quantities - can affect calcium), turnips, kale, watercress, collard greens, dandelion, chicory, mustard greens, beans, peas, celery leaves, cabbage, and brussell sprouts.

Fresh fruits, washed and rinsed in order to remove chemical residues and dirt should make up about 5 - 10% of a birds diet. The following are recommended but do not use the pits (some are poisonous): apples, oranges, cherries, pears, grapes, plums, peaches, mango, papayas apricots, bananas, and berries.

Nuts are nutritious but must be fed in moderation. They should be fed according to the fat content requirement of a particular species. Peanuts should be fed with particular caution because they can harbor aspergillus spores and may expose a bird to aspergillosis.

Macaws and new world parrots require a diet that is higher in fat. Nuts can be an important part of their diet. Cockatoos, cockatiels and budgerigars do not metabolize fat well from their bodies and are prone to developing fatty tumors and fatty liver disease. Nuts and seeds must be limited in these species.

Dairy and poultry products are excellent sources of calcium and protein. Birds will eat yogurt, cheese, eggs and chicken. Meat can also be offered as a good protein source. Beans and legumes can be used as a substitute for meat and are excellent protein sources.

Water is very important and should be changed twice daily. Water filters can be used to assure clean water. Do not add vitamins to your bird's water unless instructed to do so by your avian veterinarian.

Protein and Energy Requirements

Proteins provide both essential amino acids and a nitrogen source. Ten of the 22 amino acids are essential in birds: leucine, lysine, methionine, phenylalanine, threonine, tryptophan, isoleucine, valine, arginine and histidine. Glycine is a conditionally essential amino acid, and is required if methionine or arginine are deficient. Avian diets for psittacines and passerines should provide 10% to 15% dietary protein for adult birds, and 16% to 20% for growing birds. Protein levels also vary by species, budgerigars require 10-11% whereas pigeons require 13%. Protein deficiencies result in weight loss, reduced immunocompetence, loss of cell integrity, and feather abnormalities (color and structure). Protein levels greater than 25% have been shown to have detrimental effects in growing birds.

Fat is a source of concentrated energy and a carrier for fat-soluble vitamins (A,D,E,K). They provide essential fatty acids (EFA) that are required for cell membrane integrity and hormone synthesis. Linoleic acid is the only EFA for which a dietary requirement has been shown; it must be present at 1% of the diet to avoid problems. Linoleic deficiency causes rough, flaky skin and increased water intake.

Carbohydrates provide energy and are classified as digestible (sugars and starches) and indigestible (fiber). Digestible carbohydrates provide less energy (by weight) than fat does. However, for anorectic or weak birds, carbohydrates are a better energy source, because carbohydrate energy is absorbed within minutes.

Vitamins Minerals and Nutritional

Minerals and vitamins work together and should be considered with respect to each other. It is essential that they be appropriately balanced within the diet.

- **Calcium** is essential for skeletal development and maintenance and neuromuscular function. It works in association with phosphorus and Vitamin D. Calcium sources include cheese, dark green leafy vegetables, yogurt, oyster shell, limestone, canunda shell, and cuttlefish. Excess supplementation can cause renal tubular calcification and visceral gout. Deficiencies cause rickets, soft shelled eggs, egg binding, seizures and cardiac arrest. Calcium requirements for growing chicks are 0.6-1.2% dietary calcium. Breeding birds need, .35% for small psittacines, 0.8% for budgerigars, and 1% for larger psittacines.

Diets high in fat will have insufficient calcium:phosphorus ratios and can decrease calcium absorption. African gray parrots can mobilize skeletal calcium to maintain normal blood levels, therefore low dietary calcium causes decreased skeletal calcium and can lead to osteomalacia.

- **Phosphorus** helps maintain acid/base balance and energy metabolism within the body. It is linked with calcium metabolism. The calcium to phosphorus ratio should be 2:1. Elevated levels of phosphorus inhibit calcium absorption. Seed diets have high phosphorus to calcium levels so calcium supplementation is required.

- **Vitamin D** aids calcium absorption and regulation. Vitamin D3 is the active form used by birds. Vitamin D is influenced by UV light and levels will be low in birds kept with insufficient exposure to daylight or UV light sources. Vitamin D deficiency causes, rickets, blackening of feather colors, bone fractures, increased water consumption and soft- shelled eggs.

- **Fat-Soluble Vitamins (A,D,E, and K)** These vitamins can be stored in the body and can build up to a toxic level if oversupplemented. Deficiencies may also occur. **Vitamin A** can be converted from **B-carotene**, but both vitamin A and B-carotene may be deficient in certain diets. Hypovitaminosis A can be seen in all birds, but is most common in African Grey, Amazons and Eclectus Parrots. Clinical signs are usually related to the respiratory tract. **Vitamin E** is usually found in adequate amounts in a normal diet. Deficiency can occur due to oxidation by unsaturated fatty acids (excessive dietary cod liver oil). Deficiency causes encephalomalacia and nutritional muscular dystrophy. **Vitamin K** is synthesized by intestinal bacteria. Deficiency can result in hemorrhaging and prolonged clotting times.

- **Water-soluble Vitamins (B and C)** - B vitamins are involved in energy metabolism. Deficiencies may produce growth retardation, weakness and poor feathering. Riboflavin (B2) concentrations may be low and should be supplemented with a rich source (yeast). B12 is synthesized by intestinal bacteria and can be affected by antibiotics. **Vitamin C** requirements are species dependent. Vitamin C is synthesized from glucose in the liver and kidneys. Some of the passerine species can not synthesize vitamin C, so their diet must be supplemented. Frugivorous and nectarivorous species may require vitamin C. Deficiency results in scurvy.

- **Macrominerals: Magnesium, potassium, sodium and chlorine** are usually sufficient in a normal diet. **Magnesium** functions in bone metabolism with calcium, phosphorus and vitamin D. **Sodium, chlorine, and potassium** are important for regulation of the body's osmotic activity and pH.

- **Microminerals: Iodine, zinc, iron, copper, and manganese** levels vary by geographic regions due to soil compositions. Supplementation should be done carefully. **Iodine** is essential for normal functioning of the thyroid gland. Deficiency results in thyroid gland enlargement or goiter. This condition is commonly seen in seed eating budgies at middle age. **Zinc** is usually adequate in diets. Deficiency results in anorexia, poor skin condition, slow wound healing and poor reproductive performance. Zinc toxicosis can occur in bird housed in zinc galvanized or zinc coated wire cages. **Iron** absorption varies greatly between species. Excesses (>40 mg/kg) in soft billed passerines and lories can lead to hemochromatosis and liver fibrosis (iron-storage disease). Vitamin C can increase iron absorption three to fivefold, creating toxicity. Copper is essential for plumage pigmentation and red blood cell formation. Deficiency can result in anemia. **Manganese** is involved in tendon and bone structure.

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