

Nutrition and Avian Kidney Disease

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Recently aviculturists and some avian veterinarians have begun to express concern about processed (pelleted and extruded) bird diets causing kidney disease and gout in birds, especially cockatiels. Frequently fear and reaction has replaced common sense. Some people have actually returned to seed diets and cafeteria style feeding, risking widespread nutritional deficiencies and imbalances. There are many misconceptions circulating in bird circles over this issue.

The first misconception is that processed diets are dangerously toxic to birds. The percentage of birds fed these diets, that develop kidney disease is very low, probably less than half of one percent. Aviaries experiencing "outbreaks" of kidney disease mostly see this in families of related birds or in the color mutation cockatiels. Why is this problem more prevalent in birds fed processed diets than in birds fed seed diets? Kidney disease can go unrecognized, without clinical signs, when the diet is low in protein and minerals. Seed diets are generally low in protein and extremely low in minerals (to the point of deficiency). A bird with poorly functional kidneys due to diseases (past or present), toxins, hereditary and/or congenital defects, are more likely to show clinical signs of their kidney disease when fed a processed diet, especially a breeder diet. The low incidence of kidney disease being seen is likely to coincide with the incidence of underlying kidney disease in a flock. The diet isn't causing the kidney disease, but the kidney disease can become obvious when a processed food is fed.

Another misconception is that the protein level of breeder diets and handfeeding formulas is harmful to kidneys. In research studies in poultry, turkeys had to be fed diets with 40% protein to produce gout (one clinical sign of kidney disease) and they gradually recovered when put back on a diet with 20% protein (the amount of protein usually seen in breeder diets and handfeeding formulas). Chickens had to be fed diets with 70% protein to produce gout. No toxicity studies have yet been published in psittacines; however, Tom Roudybush will be participating in a study at UC Davis in which cockatiels will be fed diets with varying amounts of protein for 1 year. Evidence of kidney disease will be monitored using blood samples and the birds' kidneys will be examined microscopically at the end of the study to search for evidence of kidney damage.

Studies at UC Davis conducted by Tom Roudybush demonstrated that 20% protein was required for growth in cockatiels. In that experiment, one group was fed 35% protein with no resulting kidney damage. It seems contrary to any logic or common sense to believe that the protein level required for growth would prove to be toxic.

All information available for all species of animals, including man, studied so far suggest that there is a wide margin of safety for dietary protein in animals with normal kidney function. The fear over protein probably arises from the fact that a poorly functional kidney cannot process the nitrogenous waste from protein like a normal, healthy kidney can. People hear that too much protein causes gout. Well, it does, in a bird with a damaged kidney. Protein does not cause kidney disease at commonly fed levels, even up to 35% protein in normal cockatiels as demonstrated in Mr. Roudybush's research.

The nutrients that have lower safety margins and must be fed more wisely are calcium and vitamin D3. Research in poultry shows that feeding too much calcium to birds that aren't laying eggs, and therefore using up calcium, can cause kidney disease. Calcium levels over 1.2% will cause kidney disease in nonlaying chickens. Calcium deficiencies can be demonstrated in psittacine chicks fed diets lower than 0.8% calcium. Therefore processed diets for breeding and growing birds should have calcium levels between 0.9% and 1.1%, and cuttlebone or mineral blocks or mineral grit, or oystershell should not be offered in addition to the diet.

Vitamin D3 has been shown to be toxic to turkeys, quail, and chickens at 4-10 times the recognized dietary requirement. No research has yet been published in psittacines to determine either the requirement or toxic level of vitamin D3. Processed diets generally use the chicken requirement. The recognized chicken requirement is 200 ICU/kg for growth and 500 ICU/kg for egg production. The safe upper limit for long term feeding in chickens is 2,800 ICU/kg. The recognized turkey requirement is 900 ICU/kg for growth and 500 ICU/kg for egg production. The upper safe limit for long term feeding in turkeys is 3,500 ICU/kg. Roudybush Breeder diets have 1,875 ICU/kg; maintenance diets have 1,125 ICU/kg, and Formula 3 Handfeeding Formula has 1,500 ICU/kg. These levels are well within what is regarded as safe for any species studied so far. We plan to perform calcium and vitamin D3 toxicity studies in cockatiels within the next 2 years.

The UC Davis cockatiel flock (all normal greys) have been fed nothing but Roudybush crumbles and water since 1981. From 1981 to 1986 they were fed nothing but breeder formula. From 1986 to present they are fed Roudybush Low-Fat Maintenance when they are not set up for breeding and fed Breeder when breeding. There has never been an increase in mortality or kidney disease since the flock was switched in 1981. Most birds that die are necropsied. The Orange-winged Amazons at UC Davis have also been on Roudybush pellets and water since 1981. All birds that die are necropsied. Again, there has been no mortality or increased incidence of kidney disease. Because most of the reports of kidney disease and gout from aviculturists are in color mutation cockatiels, it is possible that there are inherited defects of metabolism or kidney function being bred into some of these lines.

Until more information is available in psittacines, Roudybush, Inc. advises bird owners and breeders to exercise common sense and feed their birds diets that lie Within safe ranges (safe from both deficiency and toxicity) based on research performed in any avian species studied so far, including poultry. Don't feed your birds a deficient diet in order to protect the few birds that might have an underlying kidney malfunction. The following table shows just some of the nutritional hazards of feeding a seed diet:

Nutrient	Roudybush Low-Fat Maintenance	Seed Mix*
Fat	3.2%	17.7%
Calcium	0.4%	0.09%
Phosphorus	0.2 %	0.51%

Calcium: Phosphorus ratio	2:1	0.18:1
Vitamin D3	1,125 ICU/kg	0.0 ICU/kg
Vitamin A	8,250 IU/kg	0.0 IU/kg
Riboflavin	22 mg/	2 mg/kg
Niacin	250 mg/kg	33 mg/kg

*Equal parts sunflower, safflower, millet, and oat groats. Remember, if a bird selectively eats more of the sunflower and safflower in a seed mix the percentage of fat could be extremely high, 30% or more.