Basic Nutrition for Pet Birds

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The nutrition of pet birds in Australia is generally woefully inadequate. Whilst the actual nutritional requirements of most species of captive birds have not yet been defined, our feeding practices are twenty years behind those in the USA and Europe. In general, Australian aviculturists provide adequate diets to their collections but the majority of pet birds exist on seed, often just sunflower seed. All seed diets are probably the biggest single contributor to ill health in pet birds.

Diagnosing Nutritional Disorders

1. **Dietary History**
2. **Physical Examination**
3. **Nutritional Analysis**

1. Dietary History

Define the components of the diet. Many large cockatoos are fed seed mixes but only eat the sunflower seeds. Many people think that different types of sunflower seed are nutritionally different and ascribe different nutritional benefits to them. This is crap.

Examine the food dish yourself and see what seeds have been hulled. Often people neglect to tell you things the bird eats that are very healthy, such as various vegetables, so ask specific questions about specific foods.

Define the frequency of feeding of the various components. The bird may get things other than seed but only intermittently. Try to define the actual intake of the separate components. Unfortunately, most people quickly discover that Psittacines are neophobic about food, rejecting out of hand any new foods and often have color preferences. Small parrots prefer green foods and large parrots, especially the rainforest species like orange and red foods.
Find out how often food and water is offered and changed. Psittacines are fussy about their water and food and may refuse to eat it if it is mouldy or wet. Check the quality of the food. The cheap, no frills types of seed are usually the seed that everyone else has rejected and are often dirty, probably mouldy, and many of the seeds hold no interest for the birds anyway.

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2. Physical Examination

Signs of nutritional deficiency include:

- Weakness of limbs, wings and ataxia. This is indicative of calcium deficiency, Vitamin E deficiency or cachexia
- Pathological fractures, lameness, soft shelled or deformed eggs and egg binding all indicate calcium deficiency.
- Chronic problems with eyes, sinuses, upper respiratory tract, white plaques in mouth, blunted choanal papillae, and foot problems are suggestive of Vitamin A deficiency.
- Beak problems such as overgrowth, hyperkeratosis, and malocclusion can indicate protein deficiencies or hepatic lipidosis.
- Thinning, swelling, peeling and ulceration of the skin can indicate malnutrition.
- Feathers which are tattered, discolored, bent and lacking elasticity indicate malnutrition.
- Birds should be condition scored using the pectoral muscles. The Pectorals should be convex, with only the edge of the keel showing.
- Droppings may change color with brightly colored foods. The appearance of whole seeds may indicate Vitamin E deficiency or excess oil in diet.
- Radiographs are useful in assessing mineralisation and pathological fractures.

3. Nutritional Analysis

Four basic types of diet are fed. Some people use mixtures of these. Remember, different species have different requirements so the diet needs to be assessed in terms of the species of bird. The smaller species such as Budgerigars and Lovebirds seem to be able to survive on higher proportions of seed than the larger parrots and cockatoos. The rain forest species such as Eclectus and the South American species; Amazons and Macaws, have a much higher requirement for vitamin A. Then again, the lorikeets have very specialised diets, requiring nectar, fruit and an easily digestible protein source. The four alternatives are:

- Seeds and Nuts
- Fruits and Vegetables
- Home-made Complete Diets
- Complete Diets

1. **Seeds and Nuts** These diets cause the most problems for all Psittacine birds. They are extremely high in fat, often more than 50%, and high in protein as well. They are deficient in just about every vitamin and mineral, making them particularly unhealthy for growing and breeding birds. Birds on this type of diet will be at risk for calcium deficiency, Vitamin A deficiency, essential amino acid deficiencies and trace element deficiencies. As well, obesity, cardiovascular disease and hepatic lipidosis are very common causes of illness and death. Obese Budgies with massive tumors and dystocia are a major problem in this country. Obese cockatoos with tumors, hernias and dramatically shortened lifespans are also very common. All these birds are major anaesthetic risks.

   The high levels of fat and protein make these diets extremely palatable making it very hard to wean birds off them. Also, adding "healthy" supplements often becomes a waste of time as the birds ignore them, preferentially eating the high fat seeds. Unfortunately, this type of diet is easy to feed, well accepted by the birds, stores well, is cheap and easily obtained. Most people are surprised and shocked to hear that it is such a bad diet, as it is so entrenched. Patience and care must be exercised when discussing changes to the diet as both birds and owners will tend to resist strongly.

Table 1. Caloric and nutrient content of nuts and seeds.[9,12,13]

Food item	Energy (kcal/g DM[a])	Nutrient (% DM)				
		Protein	Fat	Carbohydrate	Calcium	Phosphorus
Nuts						
Peanut	5.9	26	50	10	0.06	0.4
Walnut	6.9	15	68	3	0.09	0.4
Almond	6.1	21	56	7	0.24	0.6
Macadamia	7.5	8	78	5	0.05	0.2
Cashew	7.8	14	68	3	0.04	0.5
Seeds						
Sunflower	5.8	20	48	19	0.13	0.9
Sesame	6.2	28	58	10	0.13	0.8
Pumpkin	5.8	30	49	16	0.05	1.2
Canary seed	3.5[b]	17	6.2	68	NA[c]	NA
White millet	3.6[b]	13	3.9	79	NA	NA
Red millet	3.5	13	4.2	78	NA	NA
Groats	3.9	15	7.3	78	NA	NA

[a] DM = dry matter.
[b] Metabolizable energy was calculated by using 3.5 kcal/g DM for protein and carbohydrate and 8.5 kcal/g DM for fat. Variation is not provided for these data but can be 20% in foodstuffs, which will impact nutritional data and energy levels.
[c] NA = not available.

Taken from: *Clinical Nutrition of Companion Birds*, Donoghue, S & Stahl, S, *J Av Med Surg*, 11; 4, Dec 1997, pp 228-246

2. Fruit and Vegetable Diets

Diets based on fruit and vegetables are low in protein, deficient in calcium and other minerals, fat-soluble vitamins and some water-soluble vitamins. They are low in fat, which is usually beneficial for most cage birds. They can be suitable for maintenance or weight loss but inadequate for growth and reproduction. The only fruit reported as unsafe is avocado. Lettuce is commonly disparaged but the only problem it could have is that it has almost negligible nutrient value other than water and fibre.

Fruits and vegetables make good additions to a diet, they do provide many nutrients, particularly vitamin A, as β-carotene, which is non-toxic. They also provide important visual and occupational stimuli in caged birds. At the very least, I always recommend that birds on all seed diets get a varied mix of fruits and vegetables. Any decrease in the consumption of seeds will be a positive step. Remember to warn clients that the bird may only be interested in a few and some birds may be severely phobic about certain vegetables. Parboiling the harder vegetables may increase palatability, especially in the smaller species.

3. Home-made Diets

Home-made diets attempt to provide a balanced diet by making a mixture of ingredients including fruit, vegetables, tinned beans, processed cereals, rice or pasta, bread etc. Unfortunately this is a trial and error approach and they are prone to being unbalanced. Some of these diets do work well and those developed by successful aviculturists can be recommended. Many of these however, are complex and time consuming and the busy pet bird owner will find them inconvenient to use.

Table 2. Caloric and nutrient content of produce.[12,13]

Food item	Weight (g)	Water (%)	Energy (cal/g) AF[a]	Energy (cal/g) DM[b]	Nutrient (% DM) Protein	Fat	Carbo-hydrate	Fiber	Calcium	Phos-phorus
Vegetables, mixed, frozen, ⅔ cup	100	83	0.47	2.8	16	2	68	7	0.1	0.3
Lima beans, baby, frozen, ½ cup	95	62	1.0	2.6	19	1	67	6	0.1	0.3
Mushrooms, raw, 10 small	100	90	0.27	2.7	30	6	49	9	0.1	1.3
Sweet potato, 1 large	180	64	0.82	2.8	5	1	84	2	0.1	0.2
Apple, no skin, 1 medium	128	84	0.51	3.2	1	2	86	4	tr[c]	tr
Banana, 1 medium	114	74	0.82	3.2	4	2	86	2	tr	tr
Cantaloupe, 1 cup	160	90	0.32	3.2	8	2	79	4	0.1	0.2
Strawberries, 1 cup	149	92	0.28	3.5	6	4	77	6	0.2	0.2
Lettuce, Romaine	100	94	0.18	3.0	36	7	50	11	1.1	0.4
Spinach, raw	100	91	0.26	2.9	36	3	48	7	1.0	0.6
Dandelion greens, raw	100	86	0.44	3.1	18	5	61	11	1.2	0.4
Beet greens, raw	100	91	0.24	2.7	24	3	51	14	1.3	0.4
Alfalfa sprouts, raw	100	88	0.39	3.2	37	4	39	12	0.3	0.8

[a] AF = as fed basis.
[b] DM = dry matter basis.
[c] tr = trace amounts.

Taken from: *Clinical Nutrition of Companion Birds*, Donoghue, S & Stahl, S, *J Av Med Surg*, 11; 4, Dec 1997, pp 228-246

4. Commercial Complete Diets

There is an increasing number of these available in Australia. They are generally pellets, purport to be completely balanced and usually have separate formulae for maintenance, growth/handrearing and reproduction. In many ways they are the simplest method of providing a balanced diet for most species of cage bird.

A number of problems exist. The exact nutrient requirements of cage birds are not fully defined so none of these diets can truly claim to be balanced. Problems with deficiency and excess have been reported. However, many of these diets are well established and have proven records of success. I would be wary of newly arrived diets without a decent track record. Also, you tend to get what you pay for, so avoid cheap alternatives.

Many birds are reluctant to eat them and this is talked about at length overseas. It seems to particularly apply to the large parrots. In contrast, the experience of others and myself has shown that most Cockatiels and budgies are readily weaned onto pelleted diets within 2 weeks.

Use of Supplemental Vitamins and Minerals

These should definitely be avoided when using commercial complete diets. Vitamins A and D, selenium, zinc and copper can easily be fed at toxic levels. They can be used with other types of diet but care must be taken. The main problem is administering them. They may make water unacceptable and the desert species in particular will refuse to drink for weeks if they feel inclined. Placing powder no the seed is hit and miss as most birds' hull the seeds.

Summary

The most important thing is to make people aware of the problems with seed based diets. At the very least, I recommend that sunflower seeds be removed from the diet completely. My preferred option is the use of a pelleted diet with fruit and vegetable supplements. I have found that many "Sunflower Addicts" that previously refused vegetables and fruit will start eating them, when on pelleted diets. I suspect that this is due to a massive decrease in the calories in the diet and the birds are a bit hungrier.

Alternately, put the bird onto the low fat seeds e.g. millets, oats and canary seed and try to get them to eat as much fruit, veges, bread, pasta etc. as possible. I tend to tell the owner to feed the bird anything *they* are eating that is regarded as "healthy".

To overcome problems with neophobia and conversion of "Seed Junkies" I recommend that they introduce unfamiliar foods as young as possible, and that the owner makes a big show of eating and enjoying the food (including pelleted diets) in front of the bird. Birds watch flockmates carefully when confronted with new foods and will follow the leader.

I will recommend supplements if the bird has clinical signs of a nutritional deficiency. Long acting vitamin injections and water-soluble powders are probably the best

options. Shell grit, cuttle bone and calcium blocks are also effective and readily accepted by most birds.

Recommended Reading

1. ***Clinical Nutrition of Companion Birds***, Donoghue, S & Stahl, S, J Av Med Surg, 11:4, Dec 1997, pp 228-246
2. ***Nutrition and Nutritional Disorders,*** Seminars in Avian and Exotic Pet Medicine, 7:3, July 1998, Saunders, Philadelphia
3. ***Nutrition,*** Roudybush, T, *In:* Avian Medicine and Surgery, Altman, Clubb et al, WB Saunders, Philadelphia 1997:27-44
4. ***Feeding Your Pet Bird,*** Burgmann, P M, WB Saunders, Philadelphia, 1993
5. ***Avian Medicine: Principles and Applications,*** Richie, Harrison and Harrison, Wingers, 1994
6. ***Diseases of Cage and Aviary Birds 3rd ed,*** Rosskopf and Woerpel, Williams and Wilkins, 1996