Avian Nutrition: Practical Applications

LafeberVet Program #1160344

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I. Introduction

- Diet plays a pivotal role in influencing both health and the development of disease
- Every species of bird has specific nutritional requirements

II. Life stage nutrition

- A practice of feeding foods that are designed to meet your bird's optimal or best nutritional needs at a specific age or physiologic state
- Nutritional vary from neonate to adult to senior with other life stage variations in between

III. Improper nutrition

- The cause of about 90% of health problems and the leading cause of death in pet birds
- Clinical signs of improper nutrition in birds include:
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    - Tattered feathers
    - Curling and splitting, especially the black or discolored wingtips
    - Peeling, dry, flaky skin
    - Overgrowth and flaking of the nails and beak, bleeds easily when trimmed
    - Ocular discharge
- Nutritional deficiencies appear to accelerate the aging process in our avian patients, primarily through the loss of moisture and tissue elasticity
- Malnutrition > decline in the overall health > invites opportunistic pathogens, poor immune function > bacterial, fungal infections

IV. Patient assessment

- History, using open-ended questions
    - Presenting complaint
    - General information
        - Where did they get the bird from?
        - Do they have any experience with pet birds?

- If the bird is a hen…
    - Has she ever laid eggs?
    - How many eggs are usually in a clutch, etc.

- Housing
- Exercise? Flight?

- Medical history
- Husbandry
- Nutritional history
    - What is offered? What is actually consumed?
    - How is the bird's appetite?

- Where are they fed?

- Who feeds the bird?
- A nutritional evaluation should be performed on every bird that comes in every time

- Physical exam, including…
    - Body weight
    - Body condition scoring
    - Malnourished ≠ emaciated (obese bird)

V. Key nutrients

- Water
    - All birds should have access to fresh, clean water at all times
    - Water should be changed on a daily basis
    - Birds typically accept the county or the town water, but it is recommended that well water be boiled before allowing the bird to drink freely.
        - Well water can sometimes be contaminated by bacterial colonies in the pipes leading to the faucet
    - Sanitation
        - Clean dishes daily
        - Disinfectant at least twice a week
    - Automatic waterers
    - Keep drinking and bath water separate
- Protein
    - The minimum recommended protein allowance for maintenance in companion birds is ~12%
    - Essential amino
        - Budgerigars (glycine)
    - Excess protein
        - Renal disease
        - Behavioral changes, such as biting or feather picking, nervousness, rejection of food and regurgitation
    - Protein deficiency
        - Poor growth
        - Poor weight gain
        - Poor feather quality, plumage color changes

        - Poor reproductive performance

- Fats
    - Essential fatty acids, linoleic and arachidonic are required in birds for membranes and cell organelles
    - Lipogenesis place primarily takes place in the liver in birds
    - High energy diet
        - May lead to hepatic lipidosis, especially if exercise is restricted
        - Congestive heart failure, cardiac disease, respiratory disease
        - GI upset or diarrhea
        - Oily feathers
    - Low amounts of dietary fat
        - Weight loss
        - Reduced disease resistance
        - Overall poor growth

- Carbohydrates
    - The most important energy source for birds
    - Soluble carbohydrates
        - Starches, disaccharides, monosaccharides
        - Lactose is a disaccharide, but it is a poor energy source due to low lactase activity
    - Insoluble carbohydrates: fibers
        - Psittacine birds lack cellulase and cannot digest cellulose
        - Therefore fiber should be limited, not excluded, but limited in a bird's diet.
    - Inadequate dietary carbs
        - Leads to utilization of glucogenic amino acids
        - Problems with growth/reproduction and neurologic system problems
    - Vitamins
        - Vitamin A is extremely important
            - Helps to maintain the health of skin
            - Hypovitaminosis A
        - Renal failure, excess vitamin D and vitamin A
        - Vitamin B or thiamine deficiency is clinically and morphologically manifested with paralysis of limbs and muscle atrophy beginning from the flexors of the toes and ascending towards the extensors of legs and wings.
    - Minerals
        - Minerals are responsible for the structural integrity of the body
        - Calcium
            - Essential for bone and eggshell formation
            - Necessary for blood coagulation and nerve and muscle function
            - Calcium should be supplemented for birds on a seed-only diet.
        - High dietary phosphorus can negate adequate amounts of calcium in the diet
        - Ca:P ratio should range from about 1:1 to 2:1
        - Supplements are typically unnecessary if the bird is on a healthy diet

VI. All-seed diets

- Cons
  - Vitamins and minerals are added to seed hull, which is then removed (not ingested) by the bird
  - Can result in vitamin-mineral-protein deficiencies and excess fat

- "Seed junkies"

- Nutritional value is lost when stored

- Pros
  - Easy to offer
  - High acceptance rate
    - Birds do love seed diets
    - Keeps the tongue busy
- Less expensive than some formulated diets.

VII. Formulated foods

- Recommended to provide a complete and balanced diet
- Available in a variety of sizes; owners should select the proper size for the species and individual bird
- Pellets
  - Grains, such as corn, soybean, and oat groats, are ground up
  - Then vitamins, minerals, and other components are added to make a balanced food
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- The food material is generally not cooked and the diet will have a longer fiber chain

- Pellets may not be as palatable as extruded diets

- Extruded
  - Finely ground grains are mixed with vitamins and minerals
  - The mixture is forced through an extruder under pressure and high temperatures to create a specific shape

- The different shapes and colors can be stimulating for some birds

- Whole grains products
  - Whole grains and seeds are mixed with vitamins, minerals, and additional components, then the entire mixture is bound together
  - Similar to pellets, but the ingredients are not ground down

- Examples: Nutri-Berries (NB), Avi-Cakes (AC)

- Can be useful for transitioning a parrot from seeds to a healthy diet

- Pros of formulated diets
    - The grinding process produces a consistent pellet, which makes it difficult for birds to pick out their favorite part
    - here is quality control with regards to ingredients and manufacturing

- Longer storage is possible

- Cons of formulated diets
    - More expensive when compared to seed diets

VIII. Produce

- Fruit
    - A necessary part of the diet for some species, such as lories
    - Given the high proportion of sugar and water, should not be offered in excess to most companion parrots ($\leq$ 2 times per week)
- Vegetables offer greater nutritional benefit
    - Fresh or cooked, dark green, red and orange vegetables should be offered on a daily basis.
    - Exception: comfrey
        - This herb is popular in canary aviaries
        - Can result in liver damage
    - Place fruit and vegetables in separate containers
    - Time restriction for soft foods ($\leq$ 30 minutes) to reduce microbial growth

IX. Dietary conversion

- Conversion from an all-seed diet to a formulated diet can sometimes be challenging, but is generally not that difficult even in older birds
- Veterinary healthcare professionals must educate owners on what to look for when transitioning a bird from seed to pellets.
    - Ensure the pet is ingesting the new food, not simply crushing the food
    - Monitor fecal production
        - Amount produced
        - Color of the fecal material