

# **Nutrition for exotics: correct diets will prevent problems**

**Author :** Emma Whitlock

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**Emma Whitlock** RVN, BSc(Hons), PGDip, MCAM discusses how owners should be educated about near-natural diets for captive exotics

**HEALTH issues arising from incorrect husbandry and feeding practices are one of the biggest concerns in exotic pet medicine – many diseases are linked to, or caused by, incorrect nutrition. An understanding of the natural history of the species concerned, as well as the role of water, calories and nutrients in optimal health, is essential if nutritional management is to be effective.**

The life stage of the animal concerned should also be taken into consideration as the growing, non-breeding and breeding phases all command different dietary requirements.

## **Small mammals**

Many exotic small mammals seen in practice are herbivorous; a balanced small herbivore diet contains adequate fibre, minimal starch, and low to moderate protein levels. Both digestible and indigestible fibre is required to ensure dental health, appetite stimulation and gut motility – loss of motility can contribute to the development of constipation and caecal obstruction. Diets high in starches and refined sugars may be fine in limited supply, but when given regularly or in large quantities a disruption of caecal pH and a loss of microbes for digestion may result in intestinal disease.

## **Rabbits**

Wild rabbits are concentrate selectors, but domestic rabbits are true herbivores, described as monogastric hind-gut fermenters.

Caecotrophy is required for effective use of a rabbit's herbivorous diet as additional vitamins and proteins are obtained this way. Caecotroph ingestion increases when an animal is fed a low-energy, low-protein diet, whereas high levels of dietary protein reduce caecotroph consumption.

Processed rabbit diets may be very high in calcium, which may result in hypercalcaemia and related disorders, often involving the urinary tract. A diet of pellets alone, without any added roughage (or just pellets and alfalfa hay), may also contribute to the development of hairballs, dental disease, obesity, hepatic lipidosis and chronic soft stools.

## **Hystricomorph rodents**

Hystricomorph rodents, such as chinchillas, guinea pigs and degus are herbivorous and should be fed a diet consisting of fresh, goodquality hay, species-specific pellets and leafy green vegetables. A lack of fibrous roughage contributes to dental disease, which is commonly seen. Chinchillas should be fed species-specific pellets because they are longer and easier for the chinchilla to hold. Chinchillas practice caecotrophy as rabbits do, and guinea pigs (like rabbits) may have problems linked to excessive dietary calcium – usually involving the urinary tract.

Guinea pigs have an absolute requirement for vitamin C, thus, rabbit diets are not appropriate. Guinea pig diets must contain adequate levels of vitamin C – however, storage may decrease its effectiveness so a dose of 10mg/kg/ day added to drinking water is recommended.

## **Myomorph and sciomorph rodents**

These rodents are often fed a muesli-type diet, although pelleted diets are recommended to prevent selective feeding. Omnivorous in their tastes, myomorph rodents (rats, mice, hamsters and gerbils) and sciomorph rodents (squirrels and chipmunks) should receive a small protein ration alongside fresh fruits and vegetables.

## **Carnivores – ferrets**

Ferrets are domesticated and nutritional information about this species is well researched. As obligate carnivores, they require a high-energy diet rich in protein (more than 35 per cent) and fat (more than 15 per cent) and very low in fibre (lower than three per cent). A good-quality ferret diet should be fed ad lib (if balanced) to prevent problems such as hypoglycaemia. Ferrets have a short gastrointestinal tract and rapid gut transit time, so need to eat every three to four hours.

## **Insectivores – hedgehogs**

Hedgehogs are often fed cat food, which has inadequate protein content, and is too high in fat. This often results in obesity and dental disease. A commercial hedgehog diet is recommended, supplemented with a variety of vitamin-enriched insects. Feeding only at night and removing food first thing can help to prevent obesity.

## **Birds**

Little information is available about captive avian nutrition other than for poultry. Generalised conclusions about avian nutrition based on poultry must be made very carefully; poultry is reared to produce meat or eggs over a shortened life span – pet birds (including psittacines and raptors) require nutrition for health and longevity. Generalised conclusions pertaining to a whole host of genera or species should also be avoided. Diets must meet the needs of an individual according to its natural diet, due to the evolutionary adaptations that dictate the specific food types and feeding patterns of birds.

Alongside the different life stages, birds also have times of particular stress, which have an effect on dietary needs (such as when moulting or during initial training periods).

Carbohydrates provide the most readily available source of energy for many pet birds. These are usually in the form of sugars and starches, of which some are only minimally digestible (lactose) – intolerance and osmotic diarrhoea may develop if these are not limited. Galactose is toxic to birds when present in amounts more than 15 per cent of the diet.

Fats can be used directly as an energy source, or are deposited as an energy source for future in the storage form of body fat. Animal fats are low in essential fatty acids, whereas vegetable fats or oils are high in essential fatty acids.

Glycine is required in birds for the synthesis of uric acid. Essential amino acids are distributed differently among plant and animal proteins; consequently, most birds require some animal proteins in their diets, especially when growing.

Fibre is believed to be important in a bird's diet, although little investigation has been done. In psittacines, seed hulls provide fibre.

## **Feeding psittacines**

In the wild, psittacines select a variety of fruits, nuts, seeds, flowers, leaves, and insects, and so are not strict seed eaters. Certain birds will even eat small reptiles, rodents and other small birds. Unfortunately, bird owners are often misled by bags of food labelled "parrot mix", thinking that is all they need to feed their pet, but seeds should only form a small portion of the diet.

Although a good source of energy, seeds are low in calcium and high in phosphorus, and deficient

in vitamin A, iodine, and many essential amino acids. Any psittacine fed a predominantly seed-based diet is likely to develop calcium and vitamin A deficiency, although this may take a number of years.

Vegetables and fruits are important components of any psittacine's daily ration, providing essential vitamins, minerals and crude fibre, ensuring a varied diet and providing enrichment. Legumes, such as peas, black-eyed peas and kidney beans, are often readily accepted, and offer a wider range of essential amino acids than other vegetables. Corn is also readily accepted and is a good source of vitamin A and methionine.

Pelleted feeds are a sure way of feeding a balanced diet, but provide very little entertainment, hence, birds on this diet should be supplemented with fruits, vegetables and legumes and be provided with appropriate environmental enrichment.

Commercially prepared vitamin/mineral/amino acid supplements can be very useful, and are necessary when the diet cannot be balanced reliably. Calcium should be available, unless the bird is being fed a commercially prepared complete diet, and can be provided in the form of crushed oyster shell, cuttlebone, egg shells, dairy products or in powdered form.

## **Carnivorous birds**

Appropriate whole prey food items (chicks, quail, rats and mice) are available for feeding to carnivorous birds, but no single diet is suitable for all species. Variety is important and all parts of the prey item should be fed (never just muscle). Supplementation should be considered in times of stress. Metabolic bone disease, obesity and gastrointestinal obstruction are common problems.

## **Reptiles**

Knowledge of reptile-specific dietary and husbandry requirements is minimal in many species and errors in either regularly constitute the primary cause for morbidity and mortality in captivity. The species must be correctly identified to obtain information about its natural dietary requirements.

Reptiles may, for simplicity, be divided into four groups, although each species has requirements beyond this classification.

## **Carnivorous reptiles**

Due to the availability of whole prey, carnivorous reptiles tend to develop fewer nutritional problems; however, immature prey items should not be fed routinely due to poorly mineralised bones and lack of appropriate calcium: phosphorus ratio. It is good practice to freeze whole prey items prior to use to reduce the risk of passing on disease/parasites to the pet.

## **Insectivorous reptiles**

Insectivorous reptiles can be challenging to feed – crickets and mealworms do not constitute a balanced diet. Mealworms are extremely fatty and crickets have an excess of chitin that can lead to impactions, and neither have an appropriate calcium: phosphorus ratio. To try to prevent problems, a variety of insects should be offered after supplementing with calcium. Diets for insects can be purchased to “gut load” with calcium and vitamins prior to feeding. Commercial diets may be accepted, although there may be a reluctance to eat food that does not move. Vibrating bowls can be purchased to mimic live prey. Feline diets are sometimes fed for their high protein content; however, care must be taken to monitor fat levels and potential vitamin imbalances.

## **Omnivorous reptiles**

Omnivores eat a wide variety of food items. Problems arise when too much of any one food is consumed. Dog food may be used as a balanced portion of the ration, but the protein, fat and the vitamin/mineral content (particularly vitamin D3, of which there may be an excess) is often incorrect for the species concerned. Cat food should not be fed.

## **Herbivorous reptiles**

Herbivorous reptiles are often fed abundant poor-quality vegetables, like iceberg lettuce or cucumbers. It is difficult to balance a vegetarian diet; a wide variety of good-quality, vitaminrich products must be given, usually with vitamin and mineral supplements. Care must be taken not to over-supplement.

## **Conclusions**

Key to the avoidance of nutritional problems in exotics are variety, quantity and quality. Diets should be as natural as possible – if not physically at least in nutritional content. Food must be stored correctly – including live foods, which must themselves be fed and cared for to the highest standards.

Although now readily available for some exotic species, commercial diets cannot be entirely relied on to fulfil every need and, although some diets are good quality, many more have been produced with very little research.

In most species, fresh foods should be fed in addition to any commercial diet, to help counteract errors in formulation and to provide adequate fibre, moisture and enrichment. Most importantly, supplementation with vitamins and minerals is not a substitute for good basic nutrition – over-supplementation can create as many problems as under; in particular, care should be taken when a commercially balanced diet is being offered.

Lastly, although nutritional imbalances may be reversed, associated effects may be permanent. Client education and understanding is vital to prevent problems occurring.

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Reviewed by Neil Forbes, BVetMed, DipECZM(Avian), FRCVS