

IMPORTANCE OF NUTRITION IN CAPTIVE BREEDING PROGRAMS OF ENDANGERED BIRD SPECIES: SOME PRACTICAL EXAMPLES

Marqués, H.¹, Juan-Sallés, C.², Parás, A.³ and Baucells, M.D.⁴

¹Departamentos de Nutrición y ²Patología. conZOOlting Wildlife Management SL. Serra del Montsant 6, 08415 Bigues i Riells, Barcelona, España. conzoolting@conzoolting.com

³Departamento de Veterinaria. Africam Safari, 11 Oriente 2407, Puebla, CP 72007, México.

⁴Departament de Ciència Animal i dels Aliments. Facultat de Veterinaria, Universitat Autònoma de Barcelona, 08193 Bellaterra, Barcelona, España. mariadolores.baucells@uab.es

Introduction

The success of a captive breeding program for any endangered species depends on many factors among which is nutrition. The science of zoo nutrition has greatly advanced in the last 20 years, and continues to do so, providing a growing solid base to formulate diets for captive wild animals. However, there are still many institutions that do not base diet design on scientific evidence. Therefore during diet evaluation and pathology studies, diet imbalances are frequently detected.

Material and Methods

This is a retrospective study of the nutritional and medical records of conZOOlting Wildlife Management SL and Africam Safari during the last 4 years to evaluate the occurrence of nutritional diseases. Species analyzed comprised several species of Galliformes, Columbiformes, Falconiformes, Strigiformes, Gruiformes, Psittaciformes, Ciconiiformes, Apodiformes and Coraciiformes among others.

Diet evaluation was performed on 40 diets based on an intake study and nutrient composition of diet offered and consumed was performed using Animal Nutritionist® and Zootrition® softwares. Values obtained were compared to the nutrient requirements of each species estimated from published data. Deficiency was defined as under the requirement. Excess was defined as all values that exceeded recommended levels on 10 fold and toxicity as those that exceeded tolerance levels established by the literature.

A review of the pathology (necropsy and histopathology) records at conZOOlting Wildlife Management and Africam Safari was performed for cases of confirmed or suspected nutritional disease.

Results and Discussion

Of all the species evaluated 97% consumed diets not balanced on at least one nutrient. Diets offered and consumed were different in over 50% of the cases, indicating that most animals received more food than necessary and were able to select. Vitamins and minerals were the nutrients that needed adjustments in most diets.

Reproductive failure and/or high embryo and neonatal mortality are associated in some cases with low vitamin E levels. Most diets (>80%) had lower levels of this vitamin than desired for reproduction according to the literature. Additionally, excessive levels of vitamin A compete with vitamin E for absorption. Near 62% of the diets had extremely high levels (in some cases above tolerance level) of vitamin A, mostly due to the addition of inappropriate vitamin supplements to the diets on a daily basis. Perosis is also a common disease in newborn gallinaceous birds and may be due to deficiency of manganese and/or several B group vitamins. Almost 20% of the diets consumed evaluated were deficient in Mn. Nutritional bone disease was also a common finding in a variety of species, which concurs with the high incidence of inappropriate levels of Ca, P and / or vitamin D in the diets evaluated. Diffuse hyperplastic goiter was frequent in young psittacine birds. Although only 4 diets appeared deficient in iodine, the use of goitrogenic foods and compounds on a daily basis may have had an impact on iodine availability. Other diseases of suspected nutritional origin were aortic dissection in young ostriches (suspected Cu deficiency), hepatic lipidosis in hand-reared lorises and gout and hemosiderosis with occasional hemochromatosis in a variety of species.

Conclusions

These findings suggest that nutrition is not yet considered a priority in most captive wildlife husbandry programs. However, the results show that nutritional diseases may be frequent and pose a risk to captive breeding programs and conservation of endangered species. Nutrition should be included as an integral part of any preventive medicine program for captive wildlife to reduce the biological and economical costs of nutritional diseases.