

THE ILLEGAL PARROT TRADE IN LATIN AMERICA AND ITS CONSEQUENCES TO PARROT NUTRITION, HEALTH AND CONSERVATION¹

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Abstract. Second only to the trafficking of narcotics, the illegal wildlife trade is booming in neotropical countries such as those in Latin America which are rich in the diversity of some of the world's most enigmatic species. Parrots are one of the species most affected by this trade, which has occurred for over a thousand years but has become one of the leading reasons why so many parrot species are on the brink of extinction. There is a high demand for parrots as pets not only by people in developed nations, such as the United States, but also from people in countries where parrots are native. Sadly, few people who keep parrots truly understand their requirements for survival and the majority of parrots involved in the trade are kept in poor conditions and on inadequate diets. Hypovitaminosis A is the nutritional disorder most commonly seen in captive parrots in Latin American countries. This paper presents a review of the parrot trade in Latin America and of hypovitaminosis A in parrots. A relationship between these two subjects is established to show how knowledge of proper nutrition may aid conservation.

Key words: Latin America, hypovitaminosis A, malnourishment, parrot conservation, Parrot trade.

EL COMERCIO ILÍCITO DE LOROS EN AMÉRICA LATINA Y SUS CONSECUENCIAS PARA LA NUTRICIÓN, SALUD Y CONSERVACIÓN DE LOS LOROS

Resumen. El comercio ilícito de fauna silvestre, sólo superado por el narcotráfico, está en pleno auge en países neotropicales como los de América Latina, ricos en especies de entre las más enigmáticas del mundo. Los loros son de las especies más afectadas por este comercio, cuya historia se remonta a miles de años, pero que se ha convertido una de las principales causas de que muchas especies de loros estén al borde de la extinción. Existe una gran demanda de loros para mascotas no sólo en países desarrollados como EEUU, sino también en países donde los loros son nativos. Lamentablemente, poca gente que tiene loros comprende sus necesidades y la mayoría de loros en el comercio ilícito sufren condiciones y dietas inadecuadas. Hipovitaminosis A es la dolencia más común observada en loros en cautiverio en países de América Latina. Este artículo revisa el comercio de loros en América Latina y el efecto de la hipovitaminosis A. Establecemos una relación entre estos dos temas para mostrar cómo conocimientos sobre nutrición pueden ayudar a la conservación.

Palabras clave: América Latina, hipovitaminosis A, desnutrición, conservación de loros, comercio de loros.

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INTRODUCTION

Here is a common scene in, for example, downtown Lima, Peru: a Cherry-headed Conure (*Aratinga erythrogenys*) perches precariously against the bars of an old rusted bird cage with a door too small to exit safely. The cage is dented on one side and tossed haphazardly onto the top of a trash heap inside a small dumpster. The bird is emaciated, severely dehydrated and plucked. A half eaten corn cob sits in one corner of the cage, a fresh layer of fuzzy mold growth coats one end. A mob of people passes down a walkway next to the dumpster. It is a chaotic site as the people press forward into the small pet stores lining the path. Inside, there are dirty cages filled with puppies, kittens, parakeets, fish and lovebirds as well as a host of different pet supplies. Nervous shopkeepers watch potential customers carefully, each vying for the buying attention of the market's clientele. One person stops beside the dumpster and takes note of the conure in the cage. An anxious shopkeeper rushes over and declares the bird can be purchased for \$6.00 and if this particular bird is not satisfactory, arrangements can be made to find another one. This dirty, though seemingly legally operating pet store is in fact a front for one of Peru's most lucrative illegal markets. Above the store in rooms the size of a warehouse, parrots recently shipped in from the Amazon jungle are housed. A potential buyer need only quietly ask one of the shopkeepers in the store below if they know where a parrot can be found. "What kind of a parrot?" would be the return question asked (which is usually followed by "a parrot that talks.") "I have just the thing for you!" The shopkeeper disappears and within minutes, one of the 148 species of South American parrots is presented. Its wing feathers are hacked off, it is stuffed into a small rusted wire cage and its proud new owner is told to feed it a corn cob a day.

This scenario occurs on a daily basis in the parrot markets of Latin American countries. Parrots are harvested from the lands of their birth and sold from one trader to another. This chain of people may take any one parrot to a crowded city far from its known habitat and food sources, placed into the care of people with no knowledge of a parrot's unique requirements for survival in captivity. Malnutrition and disease leading to death is common. A parrot's

life span in the trade is typically so short that there is a constant demand for more, and more of the world's habitats are increasingly drained of its parrot species.

The authors of this paper were able to observe many of these events first hand through work with avian veterinarians in Peru and Costa Rica. Herein, we will briefly review the Latin America parrot trade, and will discuss as well the conditions under which "pet" parrots are living in these countries. The most common disease condition observed in these birds is hypovitaminosis A (Rivero Salinas 2007). This paper also presents a review of hypovitaminosis A in parrots and the diseases to which it predisposes. In all, this paper aims to demonstrate the close relationship between hypovitaminosis A and the never-ending cycle of the parrot trade, and ultimately the effects on parrot populations.

THE PARROT TRADE

The history of the parrot trade goes back thousands of years. People have always desired to own something beautiful, a piece of nature that cannot quite be tamed. Alexander the Great, Marie Antoinette, Henry VIII, and Theodore Roosevelt all had parrots. Christopher Columbus brought Cuban Amazons (*Amazona leucocephala*) back to Spain after discovering the New World. In the southwest United States (US), petroglyphs depicting parrots can be seen, indicating that there existed a trade in psittacine birds among the cultures of Middle America (Graham 1998). A common southwestern figure, the kokopelli, was frequently depicted with non-native macaws (*Ara* spp.). In addition, skeletal remains of scarlet macaws *Ara macao* can be found in burial sites of the Mogollon people in southern Arizona. These are but a few examples of the history human beings have shared with psittacine birds, a relationship continuing to the present day.

According to the *US Pet Ownership and Demographics Sourcebook* (American Veterinary Medical Association 2008), in the US, 3.9% of the nation's households own birds. These pet birds include finches, canaries, chickens, doves and parrots. That equates to over 11,199,000 pet birds, 75% of which are psittacines. The psittacine species in the US are not native; they are either domestically bred or imported from other countries. While this demonstrates a

strong presence of parrot species within the US, these figures pale in comparison to the number of parrots kept in captivity within their native countries. One study found that 24% of Costa Rican households keep one or more parrots (Drews 2002). This same study determined that despite sentimental feelings towards their pets, birds in general were kept in enclosures too small, isolated from conspecifics, maintained with an inadequate diet, had rare veterinary care and a high mortality rate. This high mortality rate caused owners to seek replacements from the wild (Drews 2002). This kind of "parrot culture" can be seen in many Latin American countries and is the driving force behind the local parrot trade.

In Peru, there are two forms of the parrot trade. The first is the legal trade, in which a "quota" of certain species is established by the government and parrot harvesters operate under a government license. The quota is supposedly based on thorough population and habitat studies and is meant to remove "surplus" individuals from the wild population (Munn 2006). The problem with this method is that the agency responsible for determining the quotas is understaffed and underpaid. Therefore, there is no real basis on which to establish numbers of parrots that can be safely removed from the wild without significantly harming the species (Munn 2006, Mendoza 2008). Parrots taken for the legal trade are most likely to be exported to other countries.

The second type of trade in Peru (and other Latin American countries) is the illegal one. This is much more common since it is not necessary to obtain permission and a license (Mendoza 2008). This illegal take has been banned in Peru since 1973, but it is still a common practice in many parts of the country (Gonzalez 2003).

The multi-million dollar parrot trade has three main markets: international, local, and the extended local market. The international market is where parrots are exported (legally or illegally) from their country of origin to another country. Until 1992, the US represented 80% of the international market for neotropical psittacines (Munn 2006). In 1992, the Wild Bird Conservation Act banned the importation of parrots into the US and significantly diminished demand in the international trade. In 2007, the European Union passed a similar act.

Currently, the local or extended local markets are the bulk of the parrot trade in Latin America, for instance particularly in Costa Rica (Mendoza 2008, Gonzalez 2003, Guzman et al. 2007). The local markets are where parrots are taken from their habitats and either kept by the family who caught them, given to a friend as a gift or sold in nearby villages. This activity was described to us as going to the market to buy fruit or bread for one's family and adding a parrot to the list of purchases (Mendoza 2008). Very little money is gained for this transaction, although selling a large number of parrots may be a way to supplement a family's income.

Extended local markets are seen in Lima, Peru. This is where parrots are taken from the Amazon jungle and transported hundreds of kilometers away to the capital city. In this was several chains of people can make a living, and parrots eventually end up in a city dweller's apartment (with an owner who knows nothing about it), surrounded by unknown foods, an unknown climate and an alien habitat (Rivero Salinas 2007, Mendoza 2008).

There are approximately 300 species of parrots in the world, and nearly a third is highly endangered (Snyder et al. 2000). Latin America contains almost 44% of the world's avifauna including 148 species in 27 different genera of parrots. Sizes range from the pocket-sized parrotlets (*Forpus* spp.), to the hyacinth macaw (*Anodorhynchus hyacinthinus*), the largest parrot in the world. Forty-two of these species are at risk from extinction (Snyder et al. 2000). The two most common reasons for threatened parrot populations include habitat destruction and exploitation of parrots for the pet trade (Snyder et al. 2000, Collar and Juniper 1992). During 1990 to 1994, nearly two million parrots were traded on the world market (Snyder et al. 2000). Few additional studies have been done to accurately quantify the numbers of parrots involved. Even fewer studies have been done to quantify the magnitude of local trades despite there being a strong tradition in neotropical countries for keeping parrots in captivity (Gonzales 2003, Guzman et al. 2007).

In Peru, one study related to the local trade was undertaken in the southern part of the Pacaya-Samiria National reserve near Victoria village (Gonzalez 2003). This study found at least 33 species of parrots that frequently were

taken and sold in local markets with parakeets (*Brotogeris versicolorus*, *B. cyanoptera*, *B. sanctithomae*), amazons (*Amazona amazonica*, *A. festiva*, *A. ochrocephala*), and macaws (*Ara ararauna*, *A. macao*) being the most commonly traded species. The White or Canary-winged Parakeet (*B. versicolorus*) is the most frequently sold pet in the area, but Orange-winged Amazon (*A. amazonica*), Festive Amazon (*A. festiva*) and Blue and Yellow Macaw (*A. ararauna*) are the most important species in terms of gross profit for local people and from a conservation standpoint (Gonzalez 2003). This activity, locally called loreada, is practiced from February to April by many residents of Victoria and the neighboring villages. The trade represents an important source of income for local families during the flood season, when fish and agricultural products are scarce. We found that the trade chain was organized through intermediaries and commercial dealers who bought parrot nestlings from the trappers at Victoria and shipped them hidden in boats to the city markets of Iquitos and Pucallpa. On these boats, birds were transported enclosed in wooden boxes in groups of 50 to 150, and were soaked in water when approaching governmental controls so that they would remain quiet. Most of the smuggled birds were sold in the local markets of Iquitos and Pucallpa, but occasionally some birds were transported by road to the larger pet markets in Lima to be sold at a higher prices (Gonzalez 2003).

Between 1996 and 1999, seven species of parrots were collected by local poachers (loreros) in one study site, with Orange-winged Amazon (61.1% of the captures) and Blue and Yellow Macaw (25.9%) being the most commonly taken. The total number of nestlings taken during the 4-yr study was 1,718 (Gonzalez 2003). Two methods were generally used to collect nestlings: cutting down the nesting tree (for species like macaws that nest very high), or cutting open the nest cavities in order to remove all the chicks. Both methods are very destructive because sites become useless for future nesting. Mortality rates in the captures were 8% in Amazon species and as high as 48% in macaws (Gonzalez 2003). Other methods of parrot capture include netting or the use of fishing line snares; these are especially effective when capturing adult birds (Engebretson 2006).

Capture, subsequent transport, and lack of an adequate diet is very stressful for these birds. Researchers in Nicaragua estimate that, in order to compensate for mortalities, up to four times as many parrots are captured than make it to market (Engebretson 2006).

A thoroughly researched report has been generated by the Defenders of Wildlife characterizing the parrot trade in Mexico (Guzman et al. 2007). The report discovered that 65,000 to 78,500 Mexican parrots are captured each year and that the overall mortality rate for trapped parrots exceeds 75% before reaching a purchaser. This means that 50,000 to 60,000 parrots per year die in the trade. About 86-96% of all trapped Mexican parrots staying within local markets. Approximately 15,000 parrots a year enter the Mexico City pet markets alone. It is estimated that between 3,100 and 9,400 Mexican parrots are illegally smuggled across the border into the US each year (Guzman et al. 2007). This is because a parrot that would sell for \$15 in Mexico can be sold for \$250 to \$1000 in the US.

An average 31% of parrots die during transport. Parrots have to be transported across the country in a manner that escapes detection by authorities; during the trip, they are rarely fed or cared for. Transporters rely on volume to make a profit so they can withstand high mortalities. We interviewed government inspectors who occasionally were able to intercept parrot shipments, and found that many parrots were already dead or dying due to stress, rough handling, sickness, crushing, asphyxiation, temperature shock, dehydration and diarrhea. Guzman et al. (2007) stated, "The conditions of transport are appalling; 50 parrots will be stuffed into an 18 in. x 12 in. x 6 in. wooden box where they can barely move, much less seek food and water." The report concluded that efforts must be made to modify the parrot trade or else several of Mexico's native parrot species will go extinct.

People are attracted to having parrots as pets for various reasons, including companionship, entertainment, beauty, intelligence and vocal ability (Engebretson 2006). At present, owning wild parrots as pets remains socially acceptable in most neotropical countries, even where it is known that their ownership is illegal (Snyder et al 2000). Even though most countries ban trade

in wild birds, as has been discussed, it is still possible to see wild parrots being sold in markets, along rural roads, and even in pet shops. Legislation in most neotropical countries criminalizes trade but not the ownership of wild birds. As a result, enforcement is usually negligible or erratic, and in most cases government agencies are legally unable to confiscate parrots owned by individuals (Guzman et al. 2007, Snyder et al. 2000). Even when government officials are able to intervene and confiscate parrots before they have been sold in the markets, these birds are rarely released; they are placed into overly full zoos or "wildlife sanctuaries" where they are condemned to a life of captivity and fed an inadequate diet of corn, sunflower seeds and possibly fruit (Mendoza 2008, Vargas 2006). The Mexican study found that the mortality rate of parrots in rescue centers from 1995-2005 was almost 45% (Guzman et al 2007).

One study in Brazil examined the diseases seen in parrots confiscated from the illegal trade. This study found chlamydiosis in several captured Blue-fronted Amazon parrots (*Amazona aestiva*; Freitas Raso et al. 2004). Captured chicks were fed maize flour. Soon after confiscation, chicks exhibited signs of respiratory disease and malnutrition and subsequently died. All birds had signs of vitamin A deficiency and candidiasis. The chicks had been subjected to many stressors (overcrowding, inadequate and prolonged transportation, poor nutrition, and substandard sanitary conditions), increasing their susceptibility to infection (Freitas Raso et al. 2004).

VITAMIN A AND PARROT NUTRITION

Research into the nutritional requirements of psittacine species is limited and exists only for the past 20 years in developed countries (Harrison 1998). Few studies have been done on wild parrot diets partly because the diet varies according to the season, the species, and the food niche it occupies (Brue 1994). For example, the diet of Scaly-headed Parrot (*Pionus maximiliani*) in the wild (semideciduous forests in southeastern Brazil) varies according to the wet or dry season: seeds, 13 different species of flowers, corn and 29 species of fruit pulp. The parrots eat a variety of seeds throughout the year but during the dry season more fruit is

eaten than seeds (Galetti 1993). Another example is the Lilac-crowned Parrots (*Amazona finschi*) that live in deciduous forests in Mexico. These parrots were observed to consume 33 different foods during a year: seeds 81.8% of the diet, fruit 8.8%, insect larvae 6.6%, and bromeliad stems 2.9% (Renton 2001). It is very difficult if not impossible to replicate this in a captive situation, let alone be able to form a balanced diet based on an individual species' needs. Twenty years ago in the US, for instance, malnutrition was the most common problem veterinarians would see in birds (Harrison 1998). For this reason, using the nutritional needs of poultry as a guide, several companies have produced formulated psittacine diets that are in common use today (Harrison 1998).

In developing countries, such as Peru and Costa Rica, there are no commercially available psittacine feeds (Rivero Salinas 2007, Vargas 2006). Owners determine what their pet's diet will be. This all depends on that person's time and ability to seek out a variety of fresh vegetables, fruits, nuts and seeds, and the person's willingness to supply their bird with a constant fresh supply. Most people have neither the time nor knowledge to formulate a proper diet. Most people can barely afford to properly feed their own families let alone worry about a bird's dietary health. Under the widespread belief that birds eat only seeds, many birds are simply placed on seed diets out of convenience and affordability. Some efforts are made to import commercial diets produced in the US but the cost of importation plus the cost of the product are not within the majority of the bird owning public's budgets (Rivero Salins 2007).

All seed diets are deficient in many vital nutrients. These include vitamins such as A and B; minerals such as calcium and phosphorus; trace minerals such as selenium, copper, lysine and methionine; soluble and insoluble fiber; and omega 3 fatty acids (Henzler 1990). Additionally, all seed diets are very high in fat, which means a bird can meet its caloric needs relatively quickly when consuming seeds before having consumed sufficient amounts of essential nutrients. Long-term seed diets can lead to hepatic lipidosis, which can accelerate clinical signs seen in vitamin A deficiency (Henzler 1990). Seed diets also have an improper calcium:phosphorus ratio. For example, sunflower seeds contain a 1:7

ratio, while the ideal proportion for any animal is 2:1 (Henzler 1990).

Vitamins are generally not synthesized by the body in amounts sufficient to meet the animal's physiologic requirements and must be acquired through food (Brue 1994). Vitamin A is a fat-soluble vitamin and occurs in three forms, retinol (an alcohol; the storage form), retinal (an aldehyde; important in vision and the maintenance of epithelial tissues), and retinoic acid (regulatory actions, important in growth and reproduction).

The nutritional value of Vitamin A is varied and complex and the amount required varies across species and individuals depending upon reproductive status, activity level and age. Foods high in vitamin A include fish liver oil, liver, alfalfa meal, carrots, sweet potato, egg, greens such as spinach, and red peppers. Seeds and nuts are low in vitamin A (McDonald 2006). More information about Vitamin A can be found in Brue (1994), Macwhirter (1994), Klasing (1998), and McDonald (2006).

Psittacine species have evolved and adapted to a variety of habitats each with its own unique nutritional provisions. Species that have adapted to arid climates, such as the cockatiel (*Nymphicus hollandicus*) or budgerigar (*Melopsittacus undulatus*) are able to conserve nutrients within their bodies. However, those that have adapted to the neotropics, where a higher level of nutrition is routinely available, have less ability to store nutrients (Brue 1994). This is one reason why birds taken for the trade and fed a minimal diet of seeds or corn decline in health so rapidly. These birds are also under high levels of stress which, combined with the breakdown of body stores, affects the normal metabolism and levels of vitamin A as well as other vitamins and minerals (Brue 1994).

HYPOVITAMINOSIS A

According to Harrison (1998) and other experienced avian practitioners, malnutrition is responsible for up to 90% of all clinical conditions seen in birds. Hypovitaminosis A occurs when vitamin A levels in the liver are <50 IU/g wet weight (Macwhirter 1994). Signs of deficiency and length of time required before a deficiency is seen vary across species. For example, turkey chicks exhibit signs of deficiency after only five weeks, while cockatiels

can go for two years devoid of vitamin A before signs are seen (McDonald 2006). Chicks from domestic hens consuming diets high in vitamin A will have sufficient stores from the yolk to buffer 2-3 months of a diet devoid of vitamin A. However, the chicks from hens with a marginally adequate vitamin A level have low stores and may exhibit signs of deficiency soon after hatching (Klasing 1998).

Numerous clinical problems are associated with hypovitaminosis A and can be divided based on location and body system affected. In general, in the absence of vitamin A, the epithelial basal cells of mucous membranes undergo squamous metaplasia, which can drastically alter the function of the respiratory, gastrointestinal, and urogenital/ reproductive systems as well as the external appearance of a parrot's skin and feathers, which in turn leads to concurrent disease in several body systems (Macwhirter 1994). Affected birds are also severely immuno-compromised and susceptible to secondary infections. For example, in a study of cockatiels with hypovitaminosis A, diarrhea, pneumonia, and hyperkeratosis of the beak and nails were seen (McDonald 2006). For further information on hypovitaminosis A, see: Macwhirter (1994), McDonald (2006), Lumeij (1994), Echols (2006), Williams (1994), Joyner (1994), Klasing (1998), Bauck (1994), Koutsos and Klasing (2005), and Brue (1994).

A Vicious Cycle: The Parrot Trade and Hypovitaminosis A. Parrots involved in the bird trade are prime candidates for the development of hypovitaminosis A. Once birds have entered the trade, usually when they are quite young, and are fed only corn, plantains or sunflower seeds, the bird becomes accustomed to this food. Most parrots are finicky eaters and tend to eat the most familiar foods. If not offered a variety of food at a young age, they will usually gravitate to eating only one type of food (Brue 1994). Birds in the trade, accustomed to eating this poor diet, become difficult to accept new, nutritionally improved foods such as grains, nuts, fruits, vegetables or even commercially prepared food (Rivero Salinas 2007). After trying repeatedly with little success, the owner of the bird will often give up and continue to give the bird its accustomed diet even if detrimental to the bird's health. Parrots on a poor diet for a prolonged amount of time will

eventually succumb to hypovitaminosis A and associated diseases. The bird's death will prompt the owner to purchase another parrot thereby creating a demand in the parrot market.

CONCLUSION

Despite government laws, people continue to take parrots from the wild and continue to house parrots in their homes. Several research groups are attempting to find ways of sustainable take or are trying to promote other options such as ecotourism as a way for families to generate income without harming parrot populations. Nevertheless, people continue to want parrots as pets. In the US and Europe, a shift in how a pet parrot is acquired has occurred whereby importation of wild parrots has decreased and the numbers of domestically bred parrots has increased. In these developed nations, this has led to parrots more suitable to life in captivity and has spawned an awareness of parrot owners, breeders, and veterinarians to the special needs parrots require in order to survive and thrive. In countries such as those in Latin America where parrots are native, this has not occurred. Few people in these countries have been able to breed parrots successfully in captivity due to failure to provide an adequate diet for reproduction (Rivero Salinas 2007, Guzman 2007). Hypovitaminosis A and the parrot trade go hand in hand. It is obvious that more education of potential parrot owners is needed in order to decrease the demand for wild caught parrots and to increase the health and longevity of existing captive parrots. Without this essential education, conservation of these unique species will fail. This paper has shown that nutrition plays a vital role in conservation and that without proper nutrition the parrot trade will continue to promote suffering and an early demise of some of the world's most intelligent, long-lived, and enigmatic creatures.

"Many have forgotten this truth, but you must not forget it. You remain responsible, forever, for what you have tamed." Antoine de Saint-Exupery. The Little Prince.

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