

Avian Influenza and the Threat to Parrots

(A Three-Part Blog published on the Best Friends website)

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Part One: The "Rap Sheet" on "Public Enemy H5N1"

<http://network.bestfriends.org/Blogs/PostDetail.aspx?bp=1055>

In 2003, a spreading epidemic of Exotic Newcastle Disease (END) in the West and SW United States was met by a small army of workers traveling door-to-door, culling large numbers of chickens in an attempt to stop the further spread of the disease . Unfortunately, these workers also targeted other birds (including parrots) unfortunate enough to be housed within a designated danger zone. There were even reports that some workers refused to heed veterinary tests for END, which could prove that bird was not infected. A concern was that such workers might be exacerbating the situation by spreading the virus from house-to-house on fomites . [A fomite is an inanimate object which can pick up and then potentially transfer organisms such as a virus to a living animal; in this case, the fomites might be the gloves, boots, and even vehicles of the workers.]

Keep in mind that END is not a zoonotic disease--that is, one which can be transmitted from animals to humans. Imagine what might have happened if this disease of poultry was also capable of killing people!

Fast forward to the present. The deadly H5N1 strain of highly pathogenic avian influenza (HPAI) has killed more than 100 persons world-wide, mostly in Southeast Asia. Millions of birds (some have claimed half a billion) have died, either from the disease, or much more frequently, through culling at the hands of humans. Almost every related news story ends with the monotonous litany of fear that the H5N1 virus might mutate into one which could easily be spread from person-to-person, inducing a world-wide epidemic (or "pandemic") of death. Scientists and doctors--at least the less cautious of them-- seem to vie for public attention by wildly raising the estimates of the number of people who "could" die in such a pandemic.

So what is this (purported) modern-day plaque?, and is it really a "bird" flu at all?

The H5N1 designation refers to certain molecules in the virus' outer coat (called haemagglutinin or "H", and neuraminidase, or N") . "Highly pathogenic" means that the strain of virus is virulent and has the ability to cause significant disease, or death. These strains cause highly-pathogenic avian influenza or "HPAI.

Most strains of AI cause only minor disease, but those of the H5 or H7 lineages have a unique structure that identifies them as 'HPAI' viruses. This disease is mostly seen in

domestic fowl (chicken, geese, and ducks) kept in crowded, unsanitary conditions. Crowding permits viruses to jump readily to a nearby host animal even if the previous animal dies, thereby keeping the epidemic going. Wild birds have always carried more benign strains of AI, but recently, there is evidence suggesting that in some instances, wild migratory birds, especially waterfowl, have begun to carry the deadly H5N1 along their migratory routes, to parts of the world outside of SE Asia and China (such as Turkey). It is not always clear whether such birds themselves picked up the virus secondarily from contact with chickens and other domestic fowl, or whether they are the primary vectors transmitting the disease to fowl in their droppings.

Despite the exposure of tens of thousands of people to H5N1-AI, "only" a relative handful have actually died of the disease. The current AI epidemic, which commenced in 1997 with 18 cases of human infection in Hong Kong, is killing people at the rate of slightly over 10 persons per year, at least until recently. While this already comprises a significant human tragedy, it indicates that exposure to even "HPAI" does not carry a very high rate of overt disease or death in people. In fact, the presence of antibodies in certain people suggests that exposure can result in subclinical disease, inducing a successful immune response, and remission of the disease. Indeed, there have been 24 previous outbreaks of HPAI worldwide; most were limited in their spread, and only one spread internationally. In the last 16 outbreaks of H5 or H7-subtype AI, none of the cases converted to the form which can be passed directly from human to human, and only two mild cases of clinical influenza were reported in the U.S.

Thus, the "rap sheet" of this virus is a bad one--but scarcely that of bubonic plague. Nonetheless, panic has set in. Over-reactions were also visible to some degree during the SARS 'epidemic'. According to the CDC and World Health Organization, over 8,400 people worldwide contracted SARS in the 2003 outbreak and nearly 10% of these died. In the U.S., only eight people contracted laboratory-proven SARS, all of them related to overseas travel. As serious as this is, it was not the pandemic that some people predicted.

I recommend an excellent and fascinating book about the interactions between animals and humans with regard to the spread of disease, called *Beasts of the Earth: Animals, Humans, and Disease*, written by E. Fuller Torrey and Robert Yolken, and published in 2005. There's a very instructive Chapter 9 dealing with SARS and bird flu (although by necessity it lacks recent developments). In it, the authors make the distinction between "genetic drift" and "genetic shift." Genetic drift represents random mutations in proteins, including those of viruses, which may change (in the case of microbes) their ability to cause disease. This is a slow process, and may require mutations in more than one protein. In contrast, "genetic shift" is a much more rapid event in which a change in entire collections of proteins may occur, altering their ability to elicit antibodies formation as well as clinical disease. This happens annually, creating new strains each year of the routine human "flu" to which new vaccines must be created annually.

Genetic shift occurs when at least two viruses co-exist in the same animal, permitting swapping of viral components and creating a 'mutant' with greater virulence. This can happen in pigs, especially if they drink infected water or eat carcasses of infected fowl,

such as occurs in many places in SE Asia. The concern over a possible pandemic of AI stems from the fear that such genetic shift (or "recombination") could form a new AI virus capable of spreading not only between animals (including animal-to-human) but between persons, even without an intermediate animal host.

So where do parrots fit into this scenario? They are neither "fowl" nor, in general, "migratory" nor classified as "waterbirds.". Does Public Enemy #H5N1 have its sights on these birds also? And if so, what if anything can or should be done about it? I'll discuss that in Part Two: "Caught in the Cross-hairs---- Parrots as Innocent Bystanders."

Part Two: "Caught in the Crosshairs"-- Parrots as Innocent Bystanders

<http://network.bestfriends.org/Blogs/PostDetail.aspx?bp=1066>

Not all birds are equally sensitive to contracting the H5N1 virus. This variability can be reproduced in the laboratory. Since domestic fowl account for the overwhelming number of outbreaks, Birds Korea has suggested that the name "poultry flu" is more accurate than "avian influenza" (www.birdskorea.org/fluupdatesept05.asp). However, "AI" now been documented to occur as well in housecats; exotic cats (tigers and leopards); pigs; martens and ferrets, so perhaps it shouldn't have been labeled "bird flu" at all. Unfortunately for birds, the label has stuck .

A hierarchy of sensitivity to the H5N1 strain exists among various Orders of birds, and even between the species within each Order. In the lab, gallinaceous fowl (including chickens) and finches are very susceptible to contracting the virus, even more than ducks and gulls (judged by ability to replicate and to cause severe pathologic lesions when given experimentally). The larger psittacines have not been tested under such conditions, but budgerigars are clearly very susceptible (Perkins, LEL, Swayne, DE. Vet Pathol: 40:14-24, 2003; Avian Diseases 47:956-967,2003) . However, in the real world, the virtual absence of parrots among birds reported with HPAI is striking, and no large parrots are listed on the National Wildlife Health Center website among the victims of H5N1

(http://www.nwhc.usgs.gov/disease_information/avian_influenza/affected_species_chart.jsp). Rather, the strains of AI overwhelmingly reported thus far in caged parrots (including imported wild parrots tested in quarantine stations) have been low pathogenicity strains. And there has not been, to my knowledge, a single well-documented case of H5N1 in a large parrot or cockatoo, as I reviewed in PARROTS Magazine in January of this year. However, there is no proof that they are absolutely resistant to the virus, and it seems prudent to assume that parrots might contract HPAI if they mingled with infected fowl.

Well, what about that famous parrot (at first, said to be a Suriname Amazon and then a pionus) said to have been the first case of H5N1 in the UK? Well, to make a long story

short, it turned out that the sample originally tested, did not come from just that parrot but was a mixed sample containing material from a group of mesias (finch-like birds) from Taiwan who almost certainly had the disease. Although never ruled out as the perpetrator "beyond the shadow of a doubt", the parrot seems to have been proven innocent--unfortunately, well after its death. Recently a single case of H5N2 influenza was reported in a Red-lored Amazon parrot in the U.S. (Los Angeles). Although H5N2 is generally a strain of low virulence, this bird had moderately severe symptoms. However, it was not culled and was restored to health and released after prolonged quarantine. Such a rational use of science to make decisions not to kill parrots, might well be followed in other countries.

Unfortunately, it has not been. In 2004, Canadian authorities threatened to cull parrots in the For the Love of Parrots Sanctuary in Abbotsford, Canada, due to an epidemic of H7-strain AI in fowl. Eventually they backed down.. Both Indonesia and the Philippines have recently taken to culling large numbers of these beloved but vanishing birds, even in the absence of any solid medical justification. In the Philippines this year, 339 parrots smuggled from Indonesia were killed following confiscation, merely out of an imagined fear that they might carry AI. Although quarantine coupled with testing for the virus could have excluded this possibility, these simple steps apparently were not carried out.

Last year, a similar fate befell 500 parrots in the same country . Since these first 839 or so birds had all been smuggled from Indonesia, the shipments probably contained many parrots and especially cockatoos now endangered in the wild. In 2004, more than 300 lovebirds were culled there merely because they had passed through Thailand in transit. One wonders how Philippine authorities might have reacted if it had been their prize birds (such as the Red-vented cockatoo or Philippine eagle) which had been slaughtered on Indonesian soil! In Taiwan in 2004, 28 Palm and Moluccan cockatoos were slain at CKS Airport merely out of a similar fear that they might harbor the H5N1 variant of AI. However, test results returned only 24 h. later revealed that none of the 24 had been infected .

In Indonesia itself, Agriculture officials recently announced that all birds--including pet birds--within a given radius of chickens found to be infected with AI--would also be culled. Worse still, these spectacular, sentient creatures--with an intelligence likened by some psychologists to that of 2 to 4 year human children--are allegedly being burned alive. This is a profoundly inhumane approach, inconsistent both with veterinary principles in most of the world as well as with Indonesia's own strict limitations on the use of euthanasia in general. It is also inconsistent with any policy of the current government claiming to support the conservation of Indonesia's vanishing species, since it sends a message to Indonesia's people that these birds are disposable and not worthy of efforts to save them.

Despite my repeated attempts to reach officials in all three countries, not a single expression of concern about the sacrifice of endangered parrots and cockatoos has been heard.

What can be done? If H5N1 hits the shores of the U.S., will parrots be caught up in a culling frenzy, or will the scientific "forensic evidence" be sufficient to offer them a plea bargain, or outright pardons? Or will they need to be entered into a "Witness Protection program" to save their saves? I'll discuss that in Part 3.

Part Three: Winning Reprieves for our Parrots, Lories and Cockatoos <http://network.bestfriends.org/Blogs/PostDetail.aspx?bp=1071>

If parrot lovers in the U.S., U.K., Australia and other countries are going to avoid repeating the radical responses to "bird flu" seen in several of the SE Asian countries, we will have to enlist scientific fact, cool heads, and compassionate hearts in their defense, before a death sentence can even be proposed. There are some steps we can and, in my opinion, should take.

∑ Do not abandon, release or give away your beloved birds. Some rescues in the U.K. have been flooded with parrots left at their doorstep by panicked owners. In Indonesia, some people have released their pet birds from captivity--doubtlessly a death sentence in many cases.

∑ Fortunately, the H5N1 virus is not as hardy as the virus ("circovirus") which causes Psittacine Beak and Feather Disease; the latter virus can survive in the environment for months or even years. However, AI viruses are moderately hardy, and can be carried on fomites such as clothing, automobiles, food and cages and depending on conditions, survive there for days to over a month. Thus, if HPAI in psittacines becomes a more germane issue, one needs to beware the inadvertent spread of the virus, especially if one decides to bring outside birds indoors. When brought indoors, backyard or pet birds might bring the virus inside with them thereby exposing indoor birds or people.

∑ Furthermore, in my opinion, at the present time, the risk of an outdoor parrot contracting HPAI from migratory fowl flying overhead is currently so miniscule that it does not justify depriving these parrots of the huge benefits provided by the enrichment of time in the outdoors. This might change in the future. Obviously, however, co-mingling of parrots with chickens and other ground birds is strongly discouraged. Likewise, if H5N1 hits our shores, domestic cats should be kept indoors, not allowed to eat uncooked fowl products, and kept away from indoor birds, since there have recently been reports of cats contracting the H5N1 strain.

∑ Unfortunately vaccination is not much help. It may reduce mortality in fowl, but it does not eliminate shedding of the virus. Furthermore, the virus which is injected in the vaccine in order to induce an immune response, may interfere with testing to determine if that bird subsequently develops HPAI. More importantly, currently available vaccines are

not effective in some avian species and have not (to my knowledge) been tested for their efficacy in parrots. Vaccination has, however, been used in certain zoo collections in an attempt to prevent the death of rare and exotic birds.

∑ As indicated above, avian influenza flourishes under conditions of overcrowding and poor hygiene, such as in animal markets. It is possible that the crowding and often poor hygiene seen at certain bird fairs might also favor the spread of this virus. Likewise, concern about "bird flu" should be an incentive to breeders to maximize their husbandry practices and conditions.

∑ Fastidious cleanliness and disinfection of cages and premises is encouraged. At our Rehabilitation Center for confiscated parrots in Indonesian, we use Virkon-S as disinfectant due to its wide range of efficacy and low toxicity (it also kills the hardy circovirus which causes Psittacine Beak and Feather Disease).

∑ Lastly, don't forget the two central principles of avian care in the face of possible communicable diseases--quarantine and testing. With regards to the latter, PCR testing for avian influenza viruses in general, and the H5N1 strain specifically, are just now becoming available, mostly in state laboratories at the current time. PCR testing can be completed in less than a day after receipt of the sample. [The accuracy of rapid "kits" is uncertain] . It should become increasingly easy to demonstrate that your parrot does or does not have HPAI. That knowledge should not only provide relief from your anxieties, but protection from the actions of panicked neighbors or government officials. Your parrots are trusting in you to look out for them. With the proper precautions, there is currently little reason to fear that either they, or your family, should become other victims of this disease.

Author's Follow-Up: As of October, 2007, the statement remains true that no case has been documented of a psittacine spontaneously contracting H5N1-avian influenza. Furthermore, over 70 confiscated parrots have now been tested for H5N1 (often multiple times) at the Wild Animal Rescue Centers of Indonesia and none has had the disease.