10. BIRDS OF PREY IN RELATION TO POULTRY PRODUCTION AND HEALTH- Philip N. Nyaga.

ABSTRACT

Birds of prey play important but differing roles in relation to the poultry industry. On one hand some of the like the kites and the hawk prey on the chick of indigenous birds and other birds kept in the open while others like the crow and others may introduce disease into domestic flocks and humans through their presence contacts in the homes. Marabou stocks, eagles, gulls, may also spread disease to domestic birds. To prevent the birds from getting access to the poultry, fences are erected and houses have to be bird- proofed increasing cost of production. Furthermore, stringent measures in biosecurity procedures associated cost of drugs and chemicals increase cost of production. On the other hand birds of prey play a positive role in poultry production by removing vermin like rodents and snakes, making it possible to rear more birds.

In summary they play a role as agents of

- disease transmission to poultry
- influence production (chick mortality, housing costs)
- increased measures in farm biosecurity and biosafety (they remove rodents etc)
- reservoirs of disease from the environment to animals and humans

1. Introduction

The diurnal birds of prey fall into the The Accipitridae family in the order Accipitriformes where some of the well-known birds, such as hawks, eagles, kites, harriers and Old World vultures fall. The Osprey is placed in the family Pandionidae, while the Secretary bird is placed in the family Sagittariidae, and the New World vultures are now regarded as a separate family or order. The accipitrids are a family of small to large birds with strongly hooked bills and variable morphology based on diet. They feed on a range of prey items from insects to medium-sized mammals, with a number feeding on carrion and a few feeding on fruit. In this regard they play both positive and negative roles in relation to the productivity of poultry.

2. Increased measures in farm biosecurity and biosafety (they remove rodents etc).

Vultures and other scavenger birds act as terminal waste disposal agents by removing dead tissues whether normal or carrying disease thus leading to and maintaining a clean environment. By removing the dead material they reduce the milleu where micro-organism could propagate in the environment and in this way they reduce the potential for disease transmission. Others like the secretary bird eat snakes and rodents removing this menace

from the environment which could otherwise have affected poultry production. In rural areas where indigenous chicken are reared in the open and there is bush near the homestead, such birds of prey are useful to the farmers in removing annoying and destructive vermin. This leads to more chick surviving to productive age increasing the size of the flock and by extension increased productivity,

The fish eagles are a great threat to the hinterland fish farming through killing of fish in the ponds thus reducing the farm output and cutting the value chain for the farmer.

3. Influence in production through chick mortality, housing costs

Falcons, eagles, kites, hawks and crows prey on young chicks and growers in the rural areas leading to direct loses of chicken for the farmer. In addition, measures taken to trap the birds of bird-proof the houses add extra cots of poultry production in such areas.

4. Disease transmission to poultry

In the case of scavenging birds of prey like the vultures, crows, marabou stocks, some disease agents may persist in these birds and be transmitted to susceptible domestic birds through mechanical or biological means involving infection of these birds of prey. These diseases may be transmitted to domestic poultry with adverse consequences.

Avian Influenza

Two buzzards were found to carry H5N1 in year 2007 (Ruth Manwell, http://www.rr-middleeast.oie.int/download/pdf/Manvell.pdf) which has the potential for poultry and human disease occurrence. In addition the following birds were shown to be susceptible to influenze H7N3(Peregrine Falcon Falco peregrinus - Hong Kong – 2004; Goshawk Accipter gentiles – Germany – 2006; Peregrine Falcon Falco peregrinus – Slovak Republic – 2006; Buzzard Buteo buteo – Denmark – 2006 and Saker falcons Falco Cherrug – Kuwait/S.Arabia – 2005/06 ((Ruth Manwell, http://www.rr-middleeast.oie.int/download/pdf/Manvell.pdf).

Magnino et al., Veterinary Record, 2000; reported recovery, during the HPAI outbreaks in Italy in 2000, of an H7N1 virus from a saker falcon that died three days after normal hunting activity. The raptor showed a sudden onset of depression, weakness and anorexia the day after normal hunting activity and died 2 days later without further clinical signs.

HPAI virus (H5N1) was isolated from Hodgson's hawk eagles (*Spizaetus nipalensis*) confiscated at an airport (Van Borm S, Thomas I, Hanquet G, Lambrecht B, Boschmans M, Dupont G, Highly pathogenic H5N1 influenza virus in smuggled Thai eagles, Belgium. Emerg Infect Dis. 2005;11:702–5.) and from a Saker falcon.

Since fatal infections have been reported for highly pathogenic avian infl uenza A (HPAI) virus subtype H5N1 in birds of prey, experimental data was sought on the birds' susceptibility and protection after vaccination. Ten falcons vaccinated with an inactivated infl uenza virus (H5N2) vaccine seroconverted. Then 5 vaccinated and 5 nonvaccinated falcons were challenged with HPAI (H5N1). All vaccinated birds survived; all unvaccinated birds died within 5 days. All nonvaccinated falcons shed virus from the oropharynx and cloaca until death showing potential to transmit the virus to domestic chickens if present.

Aspergillosis

Aspergillosis is a common disease in raptors held in captivity, and Aspergillus fumigatus is frequently found in affected birds. This disease is both acute and chronic. The acute form occurs when birds are exposed to an overwhelming dose of spores. There is the potential to transmit disease to chickens

Bacterial disease

There are many bacteria that cause infections in domestic birds that may also affect birds of prey, some of which are: E. coli, Pseudomonas, Aeromonas, Serratia marcescens, Salmonella, Mycobacteria, Clostridia, Klebsiella, Enterobacter, Proteus, Citrobacter, Pasteurella are all species of bacteria which affect birds, psittacosis (chlamydiosis or parrot fever), and clostridial diseases.

Bumblefoot

Bumblefoot is a disease of the bottom of the feet caused by any number of different types of bacteria, e.g. Staphylococcus aureus

Parasitic disease

Blackhead

This is a disease that affects turkeys and chickens in commercial poultry, but could develop in a raptor. The cause is a protozoa and can lay dormant in the ground for years. Birds that are infected give a watery yellowish mute. The bird must be removed and the area cleaned to prevent others from developing this.

5. Reservoirs of zoonotic diseases and any diseases from the environment to animals and humans.

Diseases that spread from animals to humans are known as zoonotic diseases. For example, *Cryptococcus neoformans* is found in the droppings of wild birds such as pigeons. The dust carrying the dried bird droppings that contains the *Cryptococcus neoformans* will go into the air in plumes. People can stir up this dust and then breathe it in when they work, play, or

walk in areas where birds have been. A number of bacterial diseases can be spread directly from game birds to humans. This may be either by people handling the birds, or the disease being present in the bird's environment or on the equipment with which the birds have been in contact. Some of the diseases are comparatively rare and some may cause no clinical disease in the game birds but may cause serious disease in humans. In most cases, disease spread to humans can be prevented by good personal hygiene. The following are the most likely diseases to be caught by humans from game birds.

Avian Tuberculosis. Avian tuberculosis is usually seen in game birds over one year old. The organism that causes the disease, Mycobacterium avium, survives a long time in the environment and contaminates not only the environment but also equipment etc. Disease in humans is rare but cases have been recorded.

Campylobacteriosis. Campylobacter do not appear to cause disease in game birds and large numbers of Campylobacter bacteria can be present in the intestines of birds without them showing any clinical signs. Affected people will have diarrhoea, abdominal pain and nausea – in fact, the typical signs of food poisoning.

Chlamydiosis.(Ornithosis, Psittacosis). Chlamydiae are bacteria-like organisms. They cause disease in a wide range of domestic birds including game birds and the disease can be particularly severe in ducks. In birds, signs of disease can be very variable, from little or no obvious clinical signs to depression with eye and nasal discharges and scour. Infection in humans working with infected birds can be very serious, particularly in the very young and the aged. Clinical signs are most commonly severe ‘flu-like symptoms, and deaths in vulnerable people have been widely reported. Anyone working with birds who develops a severe ‘flu-like condition should tell their doctor about their connection with birds.

Escherichia coli (E.coli). Most of the strains of E.coli that affect game birds are not of significance in human disease. However birds can carry strains of E.coli in their intestines that are infectious to humans (particularly strain 0157) without showing any signs of disease themselves. E.coli is spread in the faeces of birds so it is important that those handling them wash and disinfect their hands well after handling birds or anything contaminated by faeces

Erysipelas. This disease causes rapid deaths in infected game birds and is seen most commonly in adults or those approaching maturity. In humans, the disease can cause skin lesions but in more severe cases infections of the heart and brain can result in fatalities. Care needs to be taken if infected carcasses are to be opened as part of a post-mortem examination as human infection in these circumstances is more likely to occur than from an intact carcass.

Listeriosis. This disease is very rare in game birds but young birds could pick up infection from contaminated soil. It is particularly likely to affect young birds either causing a generalised infection or specifically affecting the brain. In humans the disease could be caught from contact with infected birds.

Pasteurellosis. This disease can cause rapid deaths in game birds with adult birds being most commonly affected. In laying birds, egg peritonitis is often seen. Rats often spread the disease, so vermin control is important in the control of the disease. Disease spread to humans from birds is rare if the immune system of the human is working normally.

Salmonellosis. Many birds will carry Salmonellae in their guts without showing any signs of infection. Young chicks may die of a generalised infection caused by Salmonellosis but this is rare in older birds. However many salmonellae will cause disease in humans. Affected peoples will have diarrhoea, abdominal pain and nausea. Deaths due to Salmonellosis are not unknown. In most cases washing and disinfecting hands before eating and after handling birds can prevent bacterial diseases. Of particular danger is opening up infected carcasses with Erysipelas, Listeriosis and Salmonellosis. Dead birds should be submitted to your veterinary surgeon and not opened up by the stockperson. There are reports in the medical literature of other infections in humans by viruses and parasites that originated in birds.

West Nile Virus

West Nile Virus is a disease spread by mosquitoes. Some falconers are able to screen in their mews thereby reducing the mosquito population that is able to get to their hawks. Others have vaccinated their hawks with the equine vaccine. The symptoms of this disease are loss of interest in food, weight loss, listlessness, weakness, fever, sleeping and, in highly progressed cases, tremors or seizures. Also frequently seen are squinting (one or both eyes), head tilt, staggering, shuffling, inability to focus, nasal discharge, voice change (due to the paralysis setting in the throat), and spookiness. Absolute diagnosis is through a serology panel. One result of WNV that I have not seen in conventional literature is malformed feathers in the moult after recovery from a WNV infection. This photo was taken by another falconer who noticed the malformed feathers growing in on his bird. Another noted effect is localized paralysis or palsy making fine motor movement difficult. Some birds have been described as appearing hypoglycemic or drunk with their head hung down, eyelids drooping, wings open slightly for balance, difficulty swallowing a piece of meat or difficulty ripping a piece of meat. This may appear suddenly almost as a seizure then pass leaving the bird acting normally, or it may persist in a mild form. It may present as the raptor's voice has changed due to paralysis in the throat. If this is observed, it might be worthwhile to test for WNV to

see if this could be caused by the after effects of the disease. It is entirely possible that a bird came through a WNV infection without presenting substantial symptoms only later showing impact from it. The disease is transmissible to humans easily via misquitoes.

4. Factors that may reduce birds of prey

The following factors when present may reduce the numbers of birds of prey hence exposing poultry to the risk of increased numbers of vermin that would have been fed on by the birds of prey with the attendant dangers to poultry production. Furthermore the carrion they would have removed remains to contaminate the environment. These risk factors are:

a. Pollution.

Diurnal birds of prey, like all carnivores, are especially vulnerable to pesticides, insecticides, and other humanmade toxic chemicals. As chemicals are passed up the food chain from plant to plant-eater, and from plant-eater to meat-eater, they become more and more concentrated in the tissues of each succeeding animal. This process is called bioaccumulation. Organochlorines, such as DDT, PCB, and dieldrin are extremely harmful in concentrated amounts. A build up of organochlorines may cause death in adults and embryos, lead to chronic illness, or cause the thinning and premature breakage of egg shells. Though several organochlorines have been banned in the United States, including DDT in 1972, they're still used in other parts of the world. Other forms of pollution, such as acid rain and oil spills, cause prey populations to decline, and in turn cause the decline of diurnal birds of prey populations. Discarded trash, like used monofilament line, can entangle and harm individual diurnal birds of prey.

b. Poisoning.

Diurnal birds of prey may be deliberately or accidentally poisoned. Though direct poisoning is illegal in the United States, it's still practiced in other areas of the world. Accidental poisoning occurs when diurnal birds of prey eat rodents or seed-eating birds that have been poisoned by farmers for pest control. Lead poisoning occurs when diurnal birds of prey eat carcasses or live prey shot with lead bullets. In the U.S., there's been a gradual elimination of lead from shotgun shells since the mid-1980s. Diurnal birds of prey may also be killed by eating poison-laced carcasses set by ranchers for coyotes, wolves, jackals, or other animals considered pests. Some carcasses are set deliberately for diurnal birds of prey.

c. Disease & parasitism

Diurnal birds of prey are exposed to a variety of bacterial, viral, and fungal diseases, as well as internal and external parasites from the prey they eat. Though not usually fatal, infections may make a bird weak and vulnerable to other environmental factors

CONCLUSIONS

a. Birds of prey play major significant roles in the productivity of poultry
b. Birds of prey are reservoirs diseases transmitted to birds and humans
c. Some critical risk factors may reduce the birds of prey to a level where ecological balance is disturbed to the extent that it affects bird and human life markedly.

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