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Source: Journal of Wildlife Diseases, 13(3) : 294-296

Published By: Wildlife Disease Association

URL: https://doi.org/10.7589/0090-3558-13.3.294

# TREATMENT OF CAPTIVE GIANT CANADA GEESE AFFECTED BY AVIAN CHOLERA

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*Abstract:* In the spring of 1975, an epornitic of avian cholera in Nebraska affected wild waterfowl, common crows (*Corvus brachyrhynchos*), and a captive flock of giant Canada geese (*Branta canadensis maxima*). Measures taken to control the disease in the captive geese included flushing the water of their pen with fresh well water, parenteral (50 mg oxytetracycline intramuscularly) and feed (tetracycline 500 g/ton) antibiotic treatment, and removing dead waterfowl and crows from the pen, and keeping wild waterfowl and crows out of the pen. Other measures taken to prevent a recurrence of the outbreak included monitoring the area with susceptible sentinel birds and culturing nasal swabs for *Pasteurella multocida*. Young Canada geese and wood ducks (*Aix sponsa*) raised in the area also were cultured before release to assure that carriers would not be released into the wild. Presently, ponds in the pen have been dried up so that the area is less attractive to wild waterfowl. Swine feeders and waterers that have been modified to discourage their use by crows are being used to feed and water the geese.

## INTRODUCTION

In the spring of 1975, an epornitic of avian cholera (pasteurellosis) occurred in waterfowl in south-central Nebraska. This incident resulted in the death of 20,000 to 25,000 wild waterfowl representing at least 21 species and 3,000 to 4,000 common crows (*Corvus brachyrhynchos*).[5] A breeding flock of captive giant Canada geese (*Branta canadensis maxima*) on the Sacramento-Wilcox Game Management Area also were affected. This report describes the outbreak in these geese and the procedures used to diagnose, treat, control and prevent the recurrence of the disease in the flock.

## HISTORY AND TREATMENT

The Nebraska Game and Parks Commission maintains a captive flock of about 300 giant Canada geese on the Sacramento-Wilcox Game Mangement Area in south-central Nebraska. Progeny from this flock are used for a restoration program to reestablish this race of geese in its historic breeding range in the Nebraska sandhills. Mortality in the goose flock was first noted on 28 March when a dead captive goose was found during routine collection of eggs from the 45-acre goose enclosure. A second dead goose was found on 31 March, but both mortalities were attributed to stress either from breeding or a severe storm that

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occurred in the area on 26-27 March, 1975. No association was made between these mortalities and the presence of dead and dying crows in and around the Sacramento-Wilcox Game Management Area since early March.

Waterfowl mortality at other water areas in the immediate vicinity was detected during the period of 1 April through 7 April (described in another report)[5] and additional mortality occurred within the captive Canada flock on 5 April (3 geese) and 7 April (5 geese). Because of the severity of this epornitic in free-flying waterfowl, and increasing losses among the breeding flock, the Nebraska Game and Parks Commission requested assistance from the U.S. Fish and Wildlife Service's newly formed National Fish and Wildlife Health Laboratory.

#### Diagnosis

Five more dead captive geese were found on the morning of 8 April and these were examined that night. All were in excellent physical condition, having large amounts of subcutaneous and abdominal fat. Gross lesions present in the liver (necrotic foci), coronary fat (petechial hemorrhages), and myocardium (hemorrhages), were consistent with a presumptive diagnosis of avian cholera.[3] The following day liver impression smears from these geese were stained with Wright's stain and revealed numerous bipolar rod-shaped bacteria suggestive of *Pasteurella* sp. Cultures also were taken for isolation, confirmation and antibiotic sensitivity. Subsequently *Pasteurella multocida* (serotype 1) was isolated confirming the presumptive diagnosis made at necropsy.

#### Control

Twelve more dead geese were found on 9 April. As a result, control activities were initiated within the enclosure. Since the ponds within the enclosure could be filled with well water, fresh water was pumped into them in an attempt to dilute *Pasteurella* contamination already present. Use of hypochloride treatment of the pond water was not considered feasible due to the large volume (about 60 acre-feet) of water to be treated and the large amounts of organic material in the water and bottom sediment which would neutralize much of the chlorine. Approximately 300 dead wild waterfowl and 25 dead crows in various states of decomposition were removed from the enclosure and burned. Daily pickup of carcasses was then initiated along with constant daylight patrol of the perimeter and harassment of wild birds to keep them from using the enclosure.

Ten more captive geese died during the night of 9-10 April and the next afternoon each captive goose was given 50 mg oxytetracycline intramuscularly. Tetracycline feeding at 500 g/ton was initiated on 11 April and a second intramuscular injection of 50 mg of oxytetracycline was administered to each goose on 17 April. On each day, 11 April through 16 April, a single dead captive goose was found; no deaths occurred thereafter, but antibiotic treatment of the feed was continued.

On 29 April, 6 nonbreeding giant Canada geese were taken from the flock and put into two pens within the enclosure and fed untreated feed. Since no birds died, antibiotic treatment of feed was discontinued on 9 May. On 13 May, 6 white Pekin ducks were put in the goose enclosure, and on 16 May, 5 more geese from an outside source were also put in the enclosure. None of these sentinel ducks or geese contracted avian cholera, therefore, it was felt that the disease had been elmininated within the enclosure.

#### Monitoring

Cultures were taken from a number of the captive birds prior to any birds being released into the wild. All were negative for *P. multocida*. These included nasal cleft swabs of 40 of the breeder geese and 15 goslings raised in a separate area (20 May), representative young geese to be released into the wild (16 June and 30 June), and young wood ducks (*A. sponsa*) raised in a separate location on the area. Water samples taken during May and June also were negative, but any viable *Pasteurella*

present could have been destroyed since the samples were frozen between the time of collection and attempted culture and isolation.

In the fall 1975, the ponds of the area were allowed to dry and will be refilled only during the breeding season. Thus, the breeding enclosure will be less attractive to wild waterfowl. In addition, swine self-feeders and swine waterers are being used for feeding and watering the geese. They were modified by adding covers and gratings to discourage use of feed and water by crows. Perhaps these measures will prevent recurrence of avian cholera in the geese by preventing contact between them and possible sources of the bacteria.[5]

## DISCUSSION

Control of this outbreak was accomplished by reducing the sources of the bacteria through dilution and flushing of water, carcass removal, minimizing contact with wild birds, and by prophylactic or pre-clinical treatment of susceptible geese with antibiotics. Oxytetracycline was used for treatment primarily because of availability. However, subsequent sensitivity tests showed the organisms to be highly susceptible to the drug (Ikenberry, unpublished). Although sulfa drugs were available, they were not used because of the possibility of eggshell thinning[1,2,4] and their bacteriostatic nature.

Sentinel birds were used to determine if the flock could be withdrawn from the antibiotic treatment. Deaths did not occur among the white Pekin ducks fed treated feed, or among nonbreeding geese fed untreated feed. Thus, we felt that the antibiotic treatment could be safely withdrawn. Nasal cleft swabs of a proportion of the geese further assured us that *P. multocida* carriers probably were not present in the flock.

Representative young birds to be released in the Sandhill restoration program were examined similarly. Since *P. multocida* was not isolated, we felt that no carriers were being released. Perhaps, all programs in which birds raised in captivity are to be released in the wild should include screening tests for carriers of potential pathogens such as *P. multocida* and duck plague.

### Acknowledgments

We thank the U.S. Department of Agriculture, Animal Research Services, Ames, Iowa for culturing and typing the organisms and for culturing the nasal swabs.

## LITERATURE CITED

1. MUELLER, W. J. 1962. Carbonic anhydrase, diuretics and egg shell formation. Poultry Sci. 41: 1792-1796.
2. ————, R. L. BRUBAKER and M. D. CAPLAN. 1969. Egg shell formation and bone resorption in laying hens. Fed. Proc. 28: 1851-1856.
3. ROSEN, M. N. 1971. Avian Cholera: In: *Infectious and Parasitic Diseases of Wild Birds.* Davis, J. W., Anderson, R. C., Karstad, L., and Trainer, D. O. (eds.) Iowa State Univ. Press, Ames, Iowa. p. 59-74.
4. SCOTT, H. M., E. TRINGHEN and L. D. MATTERSON. 1944. The effect of feeding sulphanilamide to the laying fowl. Poultry Sci. 23: 446-453.
5. ZINKL, J. G., N. DEY, J. M. HYLAND, J. J. HURT and K. L. HEDDLESTON. 1976. An epornitic of avian cholera in waterfowl and common crows in Phelps County, Nebraska, in the spring of 1975. J. Wildl. Dis. 12: 194-198.

*Received for publication 25 October 1976*