

## **Antibiotic resistance patterns and parasite prevalence in captive versus free roaming anseriformes in a zoo setting.**

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### **Abstract**

Fecal antibiotic resistance and parasite prevalence were examined in free ranging Canada Geese (*Branta canadensis*), captive Snow Geese (*Anser caerulescens*) held in an outside enclosure at a zoo, and captive Fulvous Whistling Ducks (FWD) (*Dendrocygna bicolor*) held in an indoor enclosure at a zoo. The working hypothesis prior to the study was that the free ranging geese would have more fecal antibiotic resistance to tetracycline, ampicillin, gentamicin, and clindamycin, and a higher prevalence of parasites than the captive geese. Samples were obtained in mid-November. To ensure freshness, samples were taken only after the bird was seen defecating. Immediately after obtaining the samples, direct fecal smears were performed and smears underwent gram staining, while parasite prevalence was studied using fecal flotation. Fecal samples were also plated onto Trypticase Soy Agar (TSA) and incubated for 24 hours. After incubating, isolated colonies on the TSA plates were swabbed onto Hektoen Enteric Agar (HE) plates and incubated for 24 hours. Antibiotic discs were placed on the HE plates and zones of inhibition were measured after incubation. Cocci to rods ratio was 2:1 in all but one bird, which was free ranging. All birds had a positive: negative gram strain ratio of 1:1 except for one Canada goose in an outdoor enclosure, which had a ratio of 3:1. Parasites were mainly found in the captive geese, while only one group of free ranging geese had parasites. Preliminary results showed antibiotic resistance in one sample from free ranging geese, one from birds in the indoor enclosure, and one from birds in an outdoor enclosure. These preliminary results suggest that free ranging Anseriformes may not be a nidus for bacterial or parasitic infection in captive birds in a zoo setting, but that health care protocols in captive birds may need more frequent monitoring for potentially pathogenic agents.

Key words: Anseriformes, goose, bacterial resistance, zoo, parasite prevalence