

# Diseases of Backyard Turkeys in the Mexican Tropics

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With the purpose of identifying the causes of disease and death in backyard turkeys, 768 interviews with growers were carried out in communities of the coastal region of Oaxaca, Mexico. Later, a clinical sanitary evaluation was performed on five randomly selected turkeys of different age and sex. The laboratory tests included: necropsy for clinical diagnosis of diseases and for a histopathological examination of tissues with macroscopic lesions to identify microscopic lesions; hemagglutination inhibition tests to diagnose Newcastle disease and avian influenza; agglutination test to identify *Mycoplasma gallisepticum*, *M. synoviae*, and *Salmonella pullorum*; and enzyme-linked immunosorbent assay to identify infectious bronchitis and infectious bursal disease. Both internal and external parasites were identified. The data obtained by the interviews showed that sudden death, avian pox, respiratory disease, and diarrhea were the most important manifestations in backyard turkeys. The laboratory tests found avian pox, avian influenza, and infectious bronchitis; sensitivity to *M. synoviae* and *M. gallisepticum*; protozoal infections by *Eimeria meleagridis* and *E. dispersa*; internal parasite infestation by *Heterakis gallinae* and *Ascaridia gallinae*; and mycotoxicoeses.

**Key words:** bacterial; guajolote; mycotoxins; parasite infestation; virus

## Introduction

The turkey was domesticated in Mexico,<sup>1,2</sup> and this species' original genetic resources are found in backyard turkeys<sup>3</sup>; however, this species has been little studied. Its habitual contact with humans could provide an important source for zoonosis or emergent poultry diseases.<sup>4</sup> Vaccination programs and sanitary poultry policies have not been designed for backyard turkeys.<sup>5</sup> The current sanitary conditions could be dangerous for public and/or animal health. The research objective of this study was to identify the causes of disease and death in native turkeys.

## Materials and Methods

This research was carried out in the coastal region of Oaxaca, Mexico, in the districts of Jamiltepec, Juquila, and Pochutla, which comprise 54 boroughs. This study was conducted from September 2004 to August 2006.

The coastal region of Oaxaca is located between 16° 45'N and 96° 20'E and is 10,700 km<sup>2</sup> in extent. Dominant climate types in the region, in accordance with Köppen's Climatic Classification modified by García *et al.*,<sup>6</sup> are mild subhumid C(w1), semi-dry warm Bs1hw, warm subhumid Aw1, semi-warm subhumid (A)C(w1), and warm humid Am(f). The average precipitation is 1700 mm/year.<sup>7</sup>

A total of 768 backyard turkey growers were surveyed. The questions were focused on sanitary control and diseases, which could be observed empirically. Collected data were

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**TABLE 1.** Causes of Disease and Death in Backyard Turkeys as Reported by Growers in the Coastal Region of Oaxaca, Mexico

Cause	Frequency	Percent
Sudden death	245	31.9
Avian pox	182	23.7
Respiratory disease	181	23.6
Diarrhea	78	10.2
Do not get sick	61	7.9
Do not know	21	2.7
Total	768	100

analyzed and interpreted using descriptive statistics with the SAS System.<sup>8</sup>

A clinical sanitary evaluation was performed on five turkeys of different age and sex that were selected at random from different boroughs. The laboratory tests included: necropsy for clinical diagnosis of diseases and for a histopathological examination of tissues with macroscopic lesions to identify microscopic lesions; hemagglutination inhibition tests to diagnose Newcastle disease and avian influenza; serum plate agglutination test to identify antibodies against *Mycoplasma gallisepticum*, *M. synoviae*, and *Salmonella pullorum*; enzyme-linked immunosorbent assay (ELISA) to identify infectious bronchitis and infectious bursal disease. In addition, laboratory analyses were done to find internal and external parasites.

## Results

Data obtained from the 768 backyard turkey units are shown in Table 1. Necropsy and histopathology studies of poults showed external nodular lesions and intracytoplasmic inclusion bodies associated with avian pox. Thickened intestinal wall, inflammation, and intestinal mucosa ulcers attributable to the presence of intestinal parasites were found. Two poults had *Eimeria dispersa*, and one adult turkey had *E. meleagridis*, *Heterakis gallinae*, and *Ascaridia gallinae*. Moderate to severe tumefaction

in poults and liver fibrosis in adult specimens were also found. This was caused by liver toxicity, possibly as a result of ingesting corn grains contaminated with mycotoxins.

The results of the hemagglutination inhibition test to diagnose Newcastle disease were negative for all birds. However, using the same test with titers of 1:32 and 1:1024 in four hemagglutination samples, two adults turkeys tested positive for avian influenza. Titers of 1:10 and above were regarded as positive.

The results of the serum plate agglutination test to identify *M. gallisepticum* were positive for one 1.5-month-old poult, and all examined turkeys were positive for *M. synoviae*. The presence of seroreactivity for *S. pullorum* was not found.

Infectious bronchitis was detected by the ELISA test in the five turkeys, but the presence of infectious bursal disease was not found.

## Conclusions

Laboratory testing identified lesions compatible with avian pox and confirmed seropositivity to avian influenza and infectious bronchitis; seropositivity to *M. synoviae* and *M. gallisepticum*; protozoal infections by *E. meleagridis* and *E. dispersa*; internal parasite infestation by *H. gallinae*, *A. gallinae*, and mycotoxicoses.

Laboratory tests confirmed that avian influenza is the principal cause of sudden death in backyard turkeys, and avian influenza and infectious bronchitis are the principal causes of respiratory disease in this species. The presence of avian pox, mycoplasmosis, and internal parasite infestations were also confirmed, the latter being responsible for causing diarrhea and other digestive disorders.

This was the first study in the coastal region of Oaxaca, Mexico, in which main diseases and their causes were identified in backyard turkeys. This research will provide the foundation for establishing a specific sanitary control program for turkeys of the coastal region of Oaxaca, Mexico.

### Conflicts of Interest

The authors declare no conflicts of interest.

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