

Seroprevalence of Newcastle disease virus in backyard chickens and herd-level risk factors of Newcastle disease in poultry farms in Oman

ABSTRACT

Newcastle disease (ND) is an endemic disease in Oman's poultry industry and impacts negatively on food security. However, little is known regarding the potential risks of the disease in backyard poultry. The objectives of this study were to determine the seroprevalence of Newcastle disease virus (NDV) in backyard chickens and the herd-level risk factors in Oman. In total, 1383 serum samples were collected from chickens in 139 flocks from nine governorates. Information on associated risk factors was assessed using a semi-structured questionnaire. The samples were tested using commercial indirect ELISA kits. A logistic regression model was applied to assess the associated risk factors. The bird and flock-level NDV seroprevalence was 33.8% (95% Confidence Interval (CI): 12.8–38.6%) and 57.1% (95% CI: 35.7–71.4%), respectively. The highest seroprevalence of antibody to NDV at bird and flock levels was recorded in North Ash Sharqiyah (38.6%) and Al Buraimi (71.4%), respectively. Also, the lowest seroprevalence at bird and flock levels was recorded in Musandam (12.8%) and South Al Batinah (35.7%), respectively. A significant difference in NDV seroprevalence at flock and bird levels was only recorded in Ad Dakhliyah. Factors associated with higher seroprevalence to NDV included absence of a veterinarian in the farm (OR = 5.3; 95% CI: 2.1, 11.7), usage of dead ND vaccine (OR = 2.3; 95% CI: 1.2–4.2), employment of non-permanent staff (OR = 3.9; 95% CI: 1.5, 10.6) and free entry of visitors (OR = 6.2; 95% CI: 2.0, 20.3). In conclusion, the results of this study revealed a high exposure of backyard chickens to NDV and the identified risk factors could be vital in the prevention and control of the disease in Oman.

Keyword: Chickens; ELISA; Newcastle disease; Odds ratio; Prevalence; Vaccination