



## RESEARCH COMMUNICATION

# Seroprevalence of infectious bursal disease in non-vaccinated indigenous and exotic chickens on selected farms around Gaborone, Botswana

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### ABSTRACT

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Sera from nine out of 30 (30,0%) apparently healthy unvaccinated indigenous (Tswana) chickens had precipitating antibodies to infectious bursal disease (IBD) virus using the agar gel precipitation test. Similarly, sera from 11 out of 49 (22,4%) chickens of exotic breeds with no history of vaccination against IBD were positive for antibodies against the virus.

**Keywords:** Antibodies, indigenous, infectious bursal disease, exotic chickens

Infectious bursal disease (IBD) was first diagnosed in Botswana in 1989 (Wibberley 1994; Binta, Mushi & Adom 1995) and is now endemic. Clinical IBD occurs sporadically in broiler chicken flocks throughout the country. Only a few outbreaks of clinical disease have been reported in indigenous backyard chickens in Botswana. Most of the cases were found mainly in broiler chickens of exotic breeds.

Antibodies to IBD virus have been demonstrated in several countries in Africa, including Nigeria (Nawathe, Onunkwo & Smith 1978). A report from the United Kingdom states that although the incidence of clinical IBD in broiler flocks was low, serological evidence was suggestive of widespread subclinical infections (Faragher 1971).

IBD virus was first isolated in Belgium by Meulemans, Vinde Vogel, Halen & Schyns (1974) and within a few years had spread to 80% of the broiler chickens in that country (Meulemans, Froyman & Halen 1980).

The impact of the disease in Botswana reported by Binta *et al.* (1995) included economic loss as a result of mortality, impaired growth and exacerbation of intercurrent diseases as a sequel to acquired immunodeficiency. The antigenic identity of the field isolates is still unknown. At the time of the first outbreak, the infection was suspected to be due to a "very virulent" (VV) pathotype which had probably spread from neighbouring South Africa (Horner, Parker & Pike 1994).

The agar gel precipitation test (AGPT) has been used to demonstrate polyclonal antibodies to a multivalent IBD antigen (Faragher 1971). This test has been used not only for quantitation of antibodies to IBD (Cullen & Wyeth 1975) but also to differentiate wild-type IBD directly from infected tissues collected in the field (Snyder, Yancey & Savage 1992). It is imperative that the presence of antibodies to the virus in non-vaccinated chicken populations in Botswana is monitored considering the immunodepressive effects of the virus. This type of chicken could serve as "sentinels", monitored to document the spread and distribution of the disease as part of the national disease surveillance programme.

The aim of the present study was to investigate the prevalence of antibodies to IBD virus in the sera of apparently healthy non-vaccinated chickens of Tswana and exotic breeds in Botswana.

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A total of 79 chickens aged between 3 and 5 weeks from Sikwane, Ramotswa, Gaborone Village locations in Gaborone District were used. These comprised 49 exotic breed and 30 indigenous (backyard) Tswana chickens with no history of vaccination against IBD. The chickens were bled for serum preparation via their brachial veins using sterile vacutainer tubes without anticoagulant. The serum specimens were dispensed in 0,5 ml amounts into tubes which were stored at -20 °C until used .

For the AGPTs, 0,9% agarose (Sigma) was prepared in 0,15 M sodium chloride to which was added 0,1% sodium azide and 17 ml of the molten agar solution was poured into 100x 15 mm Petri dishes and allowed to solidify. A seven-hole gel punch template, 35 mm in composite diameter was used to cut out wells in the agar. The six outer wells were 5 mm in diameter, and were spaced 5 mm from the larger centre well which was 8 mm in diameter. The IBD antigen and the control hyperimmune serum were commercially obtained (Central Veterinary Laboratories, Weybridge, UK). The control serum was titrated against the antigen to obtain the optimum dilution for the test. One of the wells was used for the control serum. The precipitation lines were read after a 48 h incubation period in a humid box at room temperature.

The prevalence of precipitating antibodies to IBD virus in the exotic and the Tswana chickens was (22,4%) (n = 49) and 30% (n = 30) respectively (Tables 1 and 2 ).

TABLE 1 Antibodies to infectious bursal disease virus in non-vaccinated chickens of exotic breeds

Location	Number tested	Number positive	Percentage positive
Farm 1 (Sebele)	17	4	23,5
Farm 2 (Sikwane)	32	7	21,9
Total	49	11	22,4

TABLE 2 Antibodies to infectious bursal disease virus in non-vaccinated indigenous chickens in Botswana

Location	Number tested	Number positive	Percentage positive
(Sikwane)	8	4	50
(Ramotswa)	10	1	10
(Gaborone Village)	12	4	33
Total	30	9	30

Routine vaccinations against IBD are not frequently carried out in Botswana. Some broiler chicken farmers do, however, vaccinate their flocks after an outbreak of the disease has occurred on their farms. Backyard chickens are rarely vaccinated against IBD. Considering that the chickens used in the present study had never been vaccinated against IBD, then the most likely source of antibodies was either from exposure to a field strain of the virus. There is also a possibility that the chickens contracted infection from species of birds other than chickens for the virus has been isolated from turkeys (McNulty, Allan & McFerran 1979).

This is the first report on the prevalence of antibodies to IBD virus in the sera of non-vaccinated chickens in Botswana. The results suggest that subclinical infections in both broilers and backyard flocks in Botswana are more common than is realized. One of the most serious implications of this subclinical status is that the immune response to vaccines of Newcastle disease, Marek's disease and infectious laryngotracheitis (Cullen Weith 1976) may be compromised. In addition, infections such as those due to *Escherichia coli*, *Salmonella typhimurium* and *Mycoplasma synoviae* which are reportedly associated with IBD could be exacerbated. Due to the endemicity of the disease, susceptible populations of chickens would be more vulnerable to infection (Van den Berg, Gonze & Meulemans 1991).

It is therefore recommended that all the IBD isolates are typed. Regular country wide-vaccination against IBD in the various chicken populations is conducted and the vaccination response is monitored.

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