



# MOLECULAR EPIDEMIOLOGICAL STUDY OF IBD VIRUS IN BRAZILIAN POULTRY FARMS UNDER DIFFERENT VACCINATION PROGRAMS

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## ABSTRACT

Live-virus attenuated vaccines are used globally to control infectious bursal disease (IBD) in bird flocks (3). One of the major concerns with this type of vaccination is the susceptibility of vaccine agents to maternal antibodies and their potential ability to induce immunosuppression in vaccinated birds (1, 2). This generates a continuous search for new technologies in bird immunization.

Immune complex and recombinant vaccines have been used successfully in recent decades.

The objective of this research was to conduct an epidemiological study of IBD virus in birds subjected to different vaccine schedules in Brazil.

## STUDY DESIGN

Two hundred and fifty-one (251) commercial bird flocks were sampled in different regions of Brazil (south, southeast, midwest and northeast) over a 4-year period (2011 to 2014) to detect the presence of the IBD virus. Recent outbreaks, high mortality rates with clinical presence of IBD, inconsistent performance, or other signs of immunosuppression were the criteria used to select the sampled flocks. The vaccination schedule was recorded when samples were collected, and classified into three categories: recombinant vaccine, immune complex vaccine, or traditional live vaccine administered via drinking water. All samples were collected from commercial birds aged from 25 to 35-day-old. At least 5 bursae of Fabricius were selected per flock and an imprint of the bursal epithelium was taken using an FTA card (1). The nucleotides and the amino acid sequence predicted from the VP2 protein were used to characterize the virus and group classify it as: vaccine strain, very virulent strain (vvIBDV), or variant strain (Table 2) (2). All samples were analyzed and characterized by the Zoetis diagnostic laboratory in North Carolina, USA.

## RESULTS

Tables 1 and 2 show the number of samples that tested positive for IBD virus in flocks under different vaccination schedules. They also show the results of the isolation and characterization of these positive samples. Eighty-one (81) positive samples (approximately 33%) were recovered in these 251 sampled flocks. Out of all of the positive samples, approximately 49% were classified as field strains (vvIBDV and variants). The other half were compatible with the genotype of vaccines used in Brazil. The high percentage of samples that tested positive for the field virus is related to the selection criteria used, namely they were obtained from flocks that were suspected to have clinical or subclinical IBD disease. Furthermore, the high percentage of field virus shows that, even when birds receive attenuated live-virus, immune complex, or recombinant vaccines, there is a dynamic scenario in which the field virus strives to evolve and bypass the immune barrier.

**TABLE 1 - ISOLATION OF IBD VIRUS IN BIRDS SUBJECTED TO DIFFERENT VACCINATION SCHEDULES**

Vaccine schedule	Total	Negative	Positive
Recombinant	78	50	28
Immune complex	106	77	29
Traditional	67	43	24
<b>Total</b>	<b>251</b>	<b>170 (67%)</b>	<b>81 (33%)</b>

**TABLE 2 - MOLECULAR CHARACTERIZATION OF 81 POSITIVE SAMPLES CARRIED OUT BY VP2 SEQUENCING**

Vaccine schedule	Vaccine	vvIBDV	Variant
Recombinant	6	12	10
Immune complex	24	0	5
Traditional	11	7	6
<b>Total</b>	<b>41 (51%)</b>	<b>19 (23%)</b>	<b>21 (26%)</b>

## DISCUSSION

A high frequency of positive samples was observed in this research conducted on flocks receiving recombinant vaccines. This shows the field virus's ability to occupy space in the bursa of Fabricius, and therefore in the environment. Outstanding efficacy of immune complex vaccines was also demonstrated against very virulent strains of IBD virus.

The molecular profile of the IBD virus strains currently circulating in Brazil depends on the vaccination schedules which are used.

## REFERENCES

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