



Department of Poultry  
Diseases

**"Evaluation of Different Commercial Vaccines, and  
Vaccinal Programs of Infectious Bronchitis Disease  
Used in Broiler Chickens"**

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<b>AGP</b>	Ager gel precipitation
<b>Ag</b>	Antigen
<b>AGID</b>	Agar Gel Immunodiffusion
<b>AGPT</b>	Agar Gel precipitation test
<b>Ark 99</b>	Arkansas
<b>Arg</b>	Arginine
<b>aMPV</b>	Avian metapneumovirus
<b>bP</b>	Base pair
<b>BLAST</b>	Basic Local Alignment Search Tool
<b>CAM</b>	chorioallantoic membrane
<b>cDNA</b>	copy- DNA
<b>CE</b>	chicken embryo
<b>CEK</b>	chicken embryo kidney
<b>C-ELISA</b>	antigen-capture ELISA
<b>CEF</b>	Chicken embryo fibroblast
<b>CEK</b>	Chicken embryo kidney
<b>CDC</b>	Centers for disease control and prevention
<b>CH</b>	Challenged
<b>CIS</b>	Cross-immunization study
<b>CMI</b>	Cell mediated immune response
<b>CIT</b>	Cross-immunization test
<b>Conn 46</b>	Connecticut
<b>CRBCs</b>	chicken red blood cells
<b>CNV</b>	Challenged non-vaccinated
<b>CT</b>	Threshold cycle
<b>DFA</b>	Direct fluorescent antibody
<b>DNA</b>	Deoxyribonucleic acid
<b>dpi</b>	Day post-infection
<b>DW</b>	Distilled water
<b>ELISA</b>	Enzyme Linked Immunosorbent Assay

## List of abbreviations

<b>EM</b>	Electron Microscopy
<b>ECE</b>	Embryonated chicken eggs
<b>E</b>	Envelope protein
<b>EDTA</b>	Ethylene diamine tetra acetic acid
<b>Egy.</b>	Egypt
<b>EID50</b>	Embryo infective dose fifty
<b>EMBL</b>	European Molecular Biology Laboratory
<b>GI</b>	Genomic identification
<b>Glu</b>	Glutaraldehyde
<b>GOVS</b>	General organization for veterinary services
<b>HA</b>	Haemagglutination
<b>HEPA</b>	High Efficiency Particulate Air
<b>HI</b>	Haemo agglutination inhibition
<b>HG</b>	Harderian gland
<b>H&amp;E</b>	Hematoxylin and eosin
<b>HVT</b>	Herpesvirus of turkeys
<b>HVR</b>	Hyper- variable region
<b>IBD</b>	Infectious bursal disease
<b>IBV</b>	Infectious bronchitis virus
<b>IFA ML</b>	Immunofluorescence assay maximum likelihood
<b>ILT</b>	Infectious laryngotracheitis
<b>Igs</b>	Immunoglobulines
<b>IPA</b>	Immunoperoxidase assay
<b>M</b>	Membrane glycoprotein
<b>Mabs</b>	Monoclonal antibodies
<b>Mass41</b>	M41
<b>MEM</b>	Minimal Essential Medium
<b>MG</b>	<i>Mycoplasma gallicepticum</i>
<b>MS</b>	<i>Mycoplasma synoviae</i>
<b>MP</b>	Membrane protein
<b>Min</b>	Minutes
<b>mRNA</b>	Messenger RNA
<b>N</b>	Nucleocapsid protein

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<b>NDV</b>	Newcastle disease virus
<b>NIBV</b>	Nephropathogenic IBV
<b>OIE</b>	Office des epizootic international
<b>PHA</b>	Passive Haemagglutination
<b>PCR</b>	Polymerase chain reaction
<b>PI</b>	Post-inoculation
<b>PBS</b>	Phosphate buffer saline
<b>PI</b>	Post inoculation
<b>PM</b>	Post-mortem
<b>RBD</b>	Receptor binding domain
<b>RFLP</b>	Restriction fragment length polymorphism
<b>RNA</b>	Ribonucleic acid.
<b>RNP</b>	Ribo nucleoprotein complex
<b>RRT-PCR</b>	Real-Time Reverse transcriptase-PCR
<b>SN</b>	Serum neutralization test
<b>Sec</b>	Seconds
<b>S1</b>	Spike 1
<b>Ser</b>	Serine
<b>SPF</b>	Specific pathogen free
<b>TBE</b>	Tris- Borate EDTA
<b>TCoV</b>	Turkey coronavirus
<b>TOC</b>	Tracheal organ culture
<b>Var</b>	Variant
<b>VN</b>	Virus neutralization
<b>UTR</b>	Untranslated region



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## 6- Summary and conclusion

In this study the prevalence of IB among Egyptian chicken broiler farms was studied by examination of 100 chicken broiler farms distributed in 4 governorates (Assiut, Sohag, El-minia, and El-Wady El-Gadid) during the period from 2017 to 2018 using RRT-PCR. It was found that 75/100 (75%) of the flocks were positive for IBV. In relation to the vaccination, the results showed that 57 flocks were vaccinated with H120 live vaccine at one - day old and IBV were found in 43 of them with percent 75%. While in the non-vaccinated flocks (43 broiler flock) there were 32 flocks found to be infected with IBV with percent of 74%. It is clear that the percentage of infection in non-vaccinated flocks is higher than that reported in vaccinated ones.

The clinical examination of the investigated flocks revealed general signs of illness, respiratory signs and renal problems in some flocks. The respiratory signs ranged from mild to severe, gasping, sneezing, rales and coughing. Mortality rates ranging from 4-12 %. At necropsy, the main lesions found were tracheitis, lung congestion, and air-sacculitis. Some flocks frequently showed mucous or caseated material in trachea and bronchi. Pale or congested and enlarged kidneys with slight to moderate distention of the ureters with urates were also seen. The results of virus isolation of IBV in 9-11 day old ECE showed that the virus causes subcutaneous haemorrhage, curling and dwarfing after five several passages.

In the present study, partial S1 gene flanking the HVR 3 was amplified and used for typing the field isolates in Egypt. Five IBV isolates from different commercial poultry farms in Upper Egypt were analyzed by sequencing of the HVR 3 in S1 gene. The molecular data indicated that the IBV isolated in Upper Egypt from 2017 to 2018 were related to each other (90-98% identity) and according to phylogenetic analysis

isolates are found to be closely related to the variant isolates and were clustered within the Egy/Var- II subgroup (IBV-Eg-12120s-2012 and IBV/IS/885-00) and other Egyptian related strains deposited in the GenBank database.

By performing in vivo protection study, it was possible to demonstrate the level of protection of currently available live IBV Massachusetts, 793/B (1/96), (Mass/D274) and 1212B (IBVAR2) vaccine strains. The highest protection afforded by the vaccination program (D274-H120)-H120 with protection 40%, while the lowest effective vaccination program was 1212B-H120 with protection 17.3% after challenge with the isolated strain using ciliary activity, and histopathology.

In conclusion, according to this work, no vaccine regime used in the current study was able to fully protect vaccinated chickens from the current circulating variant viruses of IBV in Egypt. However, different degrees of protection have been obtained. It is recommended to design vaccination programs using respiratory virus vaccines, including Newcastle disease virus, avian influenza and infectious bronchitis, in addition to standard management practice must be performed to avoid the secondary bacterial infections. It was shown that the immunity against IBV is more complex so more work is needed to establish the underlying immune mechanisms for such higher and broader protection conferred by this vaccination programme.