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STUDIES ON AVIAN INFLUENZA H5N1 IN CHICKEN FLOCKS IN WEST DELTA

A Thesis Presented By

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For The Degree of PH.D. in Veterinary Medical Science (Poultry Diseases)

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2019

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VI. ENGLISH SUMMARY

The poultry industry in Egypt has been severely affected by continuous outbreaks of Avian influenza H5N1, resulting in severe losses to investors in the field of poultry and death of human beings who come in contact with infected birds. Many efforts to control highly pathogenic H5N1 avian influenza virus in poultry and in humans have failed despite increased biosecurity, quarantine and vaccination. Also, co-circulation of the AIV H5N1 and H9N2 in commercial chicken flocks in Egypt complicating the respiratory problems in affected flocks and poses concern for potential reassortment.

So epidemiological studies on AI viruses H5N1 subtype in West Delta governorate, Egypt from Jan., 2014 to May., 2017 were carried out. fourty broiler poultry flocks were investigated through identification by RRT-PCR then isolation of the virus in specific pathogen free (SPF) eggs Then full sequencing of hemagglutinin (HA) gene and neuraminidase (NA) of 3 H5N1 isolates was done. Finally, two commercially available vaccines (**Vectormune AI®** and **Volvac B.E.S.T ®**) were evaluated in commercial chicks in two different ages 21 days and 28 days. There were five groups, group1 vaccinated with (Vectormune AI®) alone; group 2 (Volvac B.E.S.T ®) group 3 (Vectormune AI® and Volvac B.E.S.T ®); group 4 (non-vaccinated challenged) and group 5 was kept as non vaccinated non challanged group.

The result revealed that there were 15 out of 40 broiler flocks were positive for HPAI H5 by RT-PCR 2 flocks in Alexandria ,7 El-Behera , 3 in EL-Gharbia and 3 in Kafer EL-Sheikh with a percentage of 22.5% ,46.6%,42.8% and 33.3% respectively.

Full gene sequencing of HA and NA for 3 isolates during 2017 revealed a closely related phylogenetic analysis of all strains with the classical endemic HPAI H5N1 subclade 2.2.1.2 strains from Egypt, Gaza and Israel during 2014, 2015 and 2016 regarding both genes.

The amino acid identities % of the selected isolates ranged from 95.4 to 99.2 with the Egyptian isolates from 2008 and 2015 respectively .

The highest HI titers at 28 days or 35 days of age was recorded in group 2 vaccinated with Vectormune AI® and Volvac BEST ® vaccine 7.5 log2 at 28 day and 8 log2 at 35 day old and in group 1 vaccinated with Vectormune AI® vaccine 7.4 log 2 at 28 days and 7.8 log 2 at 35 days followed by group 3 vaccinated with Volvac BEST ® vaccine 3.6 log 2 at 28 days and 4 log 2 at 35 days While, other control groups have the lowest titers 1.5 log 2 at 28 days and 0.6 log 2 at 35 days old.

Also, the first and the third groups have the highest HI titer when compared with other groups. Experimentally the rHVT-H5 vaccine appeared very protective for commercial chickens when used in one day-old chickens alone, so it is recommended to be used in areas with high infection.