Int.J.Curr.Microbiol.App.Sci (2016) *5*(11): 854-859

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 5 Number 11 (2016) pp. 854-859**
Journal homepage: http://www.ijcmas.com

Original Research Article http://dx.doi.org/10.20546/ijcmas.2016.511.097

Safety of Some Poultry Products against Avian Influenza Virus (AIV) and Newcastle Disease (ND) consumed within Erbil, Iraq

Jenan N. Bazzaz[1], Ayoub A. Bazzaz[2]*, Nawal K. Shukrey[1] and Noorhan A. Chelebi[2]

[1]Department of Animal Resource, Faculty of Agriculture, University of Salahaddeen, Erbil, Iraq
[2]Department of Basic Sciences, Faculty of Dentistry, University of Kirkuk, Iraq
**Corresponding author*

Keywords

Poultry; Avian Influenza (AVI); Newcastle disease (ND); Erbil, Iraq.

Article Info

Accepted:
20 October 2016
Available Online:
10 November 2016

A B S T R A C T

Three different poultry products, Hubbard Broiler, Turkey and backyard sold within Erbil local markets have been tested for viral infection against highly pathogenic avian influenza (HPAI) and Newcastle disease (ND). An assay test device, Quacking AI virus antigen rapid test -based on sandwich lateral flow immune-chromatophic sensitive assay- was applied to detect the AI virus via visible T-band. The result indicated negative viral infection in all three poultry products consumed in there different parts of Erbil province: *Darato, Tairawa, Qushtapa and Al-Shurta Quarter*. It is concluded that the above procedure is reliable for routine survey against these diseases while further poultry products are recommended for general health check up for the safety of public consumption.

Introduction

Due to general increase in the consumption of poultry products, the Avian Influenza (AI) has exerted an increased impact on the health of both animal and human. Avian Influenza virus (AIV) is a type-A Orthomyxovirus and produces a variety of disease syndromes in various poultry species (El-Sayed *et al*., 2011). Protection of both animal and human health from the direct spread consequences of AIV yet remains vitally a must via eradicating the disease in birds. Two poultry diseases considered sufficiently serious listed the Office International des Epizooties (OIE) are Highly Pathogenic Avian Influenza (HPAI) and Newcastle disease (ND) (Office International des Epizooties (OIE), 1996). The HPAI occurs relatively rarely, while ND is enzootic in some areas of the world and exerts a constant threat to most birds reared domestically (Alexander, 2000; Beard *et al*., 1984). Both diseases are amongst other important viral diseases of poultry do affect both domestic and wild birds worldwide.

Various techniques are implemented in diagnosing the micro-organisms specific to birds. The Para-myxoviruses isolates of avian species have been classified by serological test to nine serotypes designated i.e. APMV-1-APMV-9 and NDV has been

designated APMV-1 (Nwankiti *et al*., 2010l Gerlach, 1986). The APMV-1 strain is classified to three pathotypes based on virulence in chickens e.g. lentogenic, mesogenic and velogenic (Oluwole *et al*., 2012). The disease is characterized by respiratory symptoms such as coughing, gasping, sneezing, dropping wings, dragging legs, swelling of the tissues around the eye and neck, twisting of the neck, circling and cessation of egg production (Alexander, 2000). Human infection via exposure to infected birds can cause mild-conjunctivitis and influenza-like symptoms; and in severe cases, it can lead to some lasting impairment of vision (Nwankiti *et al*., 2010; Gerlach, 1986). While all AIV are members of the Ortho-myxoviridae family the avian influenza (AI) is caused by, type-A strains of influenza virus. The latter are classified into different subtypes according to the antigenicity of their surface proteins, hemagglutinin (HA) and neuraminidase (NA) (Capua *et al*., 2004).

On the basis of serological reactions to surface glycoprotein i.e. hemagglutination and neuraminidase), AIV could further be divided into 16 subtypes e.g. hemagglutinin (H1-H16) and nine neuraminidase (N1-N9) subtypes (Kawaoka *et al*., 1990; Rohm *et al*., 1996; Phan, 2010). The AIV in poultry are also classified on the basis of either highly pathogenic (HPAI) or low pathogenic (LPAI). The HPAI viruses are defined as those killing 75% or more of (4-8) weeks old chickens within ten days of inoculation. Only H5 and H7 subtypes viruses can cause HPAI, although not all viruses of these subtypes are virulent (Alexander, 2007). The LPAI viruses (kill less than 75% of {4-8} weeks old chickens within ten days of inoculation can include any of the 16 HA and 9 NA subtypes (Phan, 2010). Infection with AIV can be a devastating viral disease causing enormous losses in the poultry industry worldwide (Capua *et al*., 2009). Outbreaks of HPAI (H7N7) had led to 100% mortality in chickens and ducks within a few days in Netherlands during 2003 (Elbers *et al*., 2004). However, in both developed and in developing countries with their poor infrastructure, there were severe losses due to spread of the infection estimated by several billions of culled birds, and the disease become endemic in many infected countries. The estimated loss of the Egyptian poultry industry after the first emergence of highly pathogenic AI H5N1 in February 2006 was 1 billion US$ and affected the income of 1.5 million people whose livelihoods depended on poultry and about 30 million birds were culled or depopulated in Egypt in the first wave of 2006 (Meleigy, 2007).

Conventional control strategies are based mainly on surveillance, stamping out of infected flocks, movement restriction, and enforcement of bio-security measures (Swayne, 2009). Vaccination as a supportive tool in AI virus control strategies was implemented to limit the spread of H5N1 and to reduce the losses (Lee and Suarez, 2005; EFSA, 2008; van den Berg *et al*., 2008). Its fetal risk may spread everywhere, particularly the consumer countries i.e. Iraq. The objective of this study has been to scan hundreds of three types of the imported poultry to Erbil city for public consumption against the infective viruses.

Materials and Methods

Only 300 adult of three different types of birds, Hubbard broiler, Turkeys and backyards were involved for rapid test. They were subdivided into four different districts within Erbil city *Darato, Tayrawa, Qushtepe and Al-Shurta quarter* for both NDV and AIV antigen (75 birds/district). The Quacking AIV antigen rapid test device

based on sandwich lateral flow immune-chromatophic assay, has a testing window with an invisible T (test) and C (control) zones (Fig.1). When applied into the samples hole on the device, the liquid will laterally flow on the surface of the test strip. Whenever, enough AIV antigen exist in the sample, a visible T band will appear. The C band should always appear after sample is applied indicating a valid result. Accordingly, the device can accurately indicate the presence of AI virus antigen in the sample. Similarly, the same procedure and kit was used for Newcastle disease antigen.

To collect the secretion off the birds the swab sticks were inserted into bird's cloacae followed insertion them inside the assay buffer tubes. Samples were agitated to assure better sample extraction and then taken out of the cassette from the foil pouch and placed horizontally. Gradually, 3 drops of sample extraction were dropped into the sample hole "S" prior interpreting the result in 5-10 minutes.

Results and Discussion

All the sensitive rapid tests showed negative readings indicating no viral infection for both NDV and AIV in broiler, Turkey and backyard collected from four different districts of Erbil city e.g. *Darato, Tairawa, Qushtapa and Al-Shurt Quarter* (Table-1). No symptoms of the infection in the animal behavior were detectable to denote viral infection.

The technique used in this work has approved to be so sensitive in detecting a subtle infection. Accordingly, it would be recommendable for use in rapid virus detection for general poultry surveys to check the safety of animals against epidemic viruses.

The increased importance that avian influenza (AI) has gained in the fields of animal and human health, related mainly to the worldwide spread of the H5N1, the highly pathogenic (HP) AI virus, has highlighted the lack of information on many aspects of the disease. Protection the health of both animals and human from the direct consequences of AI still remains a must pending on eradication of the disease in birds (Alexander, 2007).

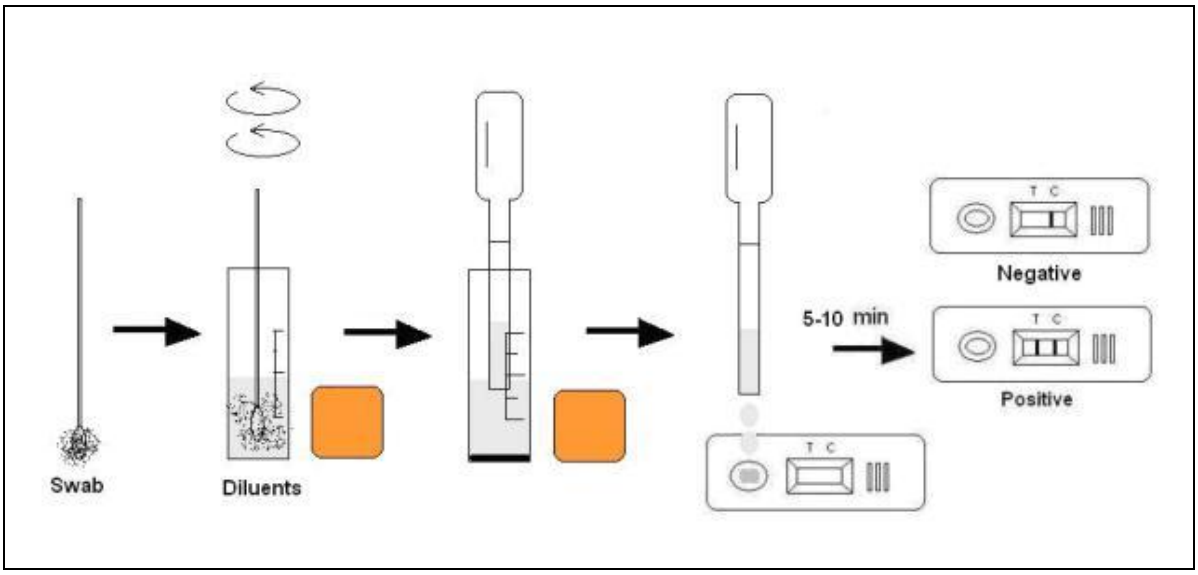
Marketing poultry birds in the local Kurdistan regions of Iraq always is carried out between 45-55 days old for all birds. Husbandry of chicks might be carried out in either small farms or inside house e.g. as domestic animals or pets. Possibility of viral spread therefore becomes more likely in such environment never mind the transmission to humans. Health checkout should be carried out regularly inside breeder farms by specialist veterinary doctors. Routine vaccination, will, therefore, be carried out against certain epidemic diseases to prevent spread and to protect the poultry products. However, health check out may be neglected by others via ignorance. This may lead, unintentionally to an outbreak of diseases elsewhere which may infect other healthy birds around. Accordingly, a rapid and an easy check out procedures retains necessary for breeders to preserve the health of their poultry products. In our survey an attempt to survey the presence of NDV and AIV in the a live stock of Hubbard broiler, Turkey and live backyard chicken after marketing in the local market in Erbil city, was carried out by picking random samples for a quick check up after marketing. The results indicated neither AIV nor NDV in the above three districts of Erbil. This may be due to successful vaccination programs applied in the poultry farms and or pro-biotic that used recently by farmers. Both direct and in direct

antiviral and the immune-stimulation effect in addition to dual use as a vaccine-vector and immune modulator are enough to prevent diseases (Sood *et al*., 2012). Field evidence has also shown that vaccination coupled with enhanced bio-security and monitoring measures could contribute to AI control (Capua *et al*., 2004; Capua *et al*., 2007).

Table.1 The results of sensitive rapid test of cloacal samples for both NDV and AIV in Hubbard broiler, Turkey and backyard. (-) indicates negative (No infection detected).

Districts/No. samples	Broiler (n=25)	Turkeys (n=25)	Backyard (n=25)
Darato (n=75)	-	-	-
Tairawa (n=75)	-	-	-
Qushtapa (n=75)	-	-	-
Al-Shurta Quarter (n=75)	-	-	-
Total	100	100	100

Fig.1 A schematic diagram to demonstrate the procedure used as the Quacking AI virus antigen rapid test device



Early survey for epidemic diseases of poultry helps in surveillance of and stops viral spread of any imported diseases to the country leading to limit the national economic losses. Accordingly, eradication of the diseases from local markets leads to public consumption safety. It would also prevent their transmission risk to human in causing conjunctivitis in human. Convenience of the methodology and accuracy to be applied as a routine quick survey in Veterinary labs for general health check out (Bio-security). It would be a first step to use any vaccination towards controlling such viral diseases from the country.

In such a quick rapid test the negative results might refer to the enhanced resistance of these birds in combating the virus and the consequence reduction of virus shedding, combined with bio-security and appropriate

surveillance, resulted in a rapid eradication of the outbreaks (Busani *et al*., 2007).

To the best of our knowledge, this study is the first attempt to survey two viral diseases in three different birds consumed within Erbil city. It would also assist in deciding whether or not and when vaccination becomes necessary to prevent spread the virus. This work could be extended to include other type of birds for the safety of public health and consumption.

References

Alexander, D.J. 2000. Newcastle disease and other avian paramyxo-viruses. *Rev. Sci. Tech. Off. Int. Epiz*., United Kingdom, 19(2): 443-462.

Alexander, D.J. 2007. 'A review of avian influenza in different bird species', Veterinary. *Microbiol.*, 74(1-2): 3–13.

Alexander, D.J. 2007. An overview of the epidemiology of avian influenza. *Vaccine*, 25(30): 5637–5644.

Beard, C.W., Hanson, R.P. 1984. Newcastle disease. In Hofsad, MS; Barnes, HJ; Clanek, BW; Reid, WM and Yoder, HW; 8th ed. Disease of poultry. Iowa State University Ames. pp: 452–470.

Busani, L., Dalla Pozza, M., Bonfanti, L., Toson, M., Ferrè, N., Marangon, S. 2007. Intervention strategies for low-pathogenic avian influenza control in Italy. *Avian Dis.,* 51(1S): 470-473.

Capua, A., Marangon, S. 2004. 'Vaccination for avian influenza in Asia', *Vaccine;* 22(31–32): 4137–4138.

Capua, I., Alexander, D.J. 2009. Avian influenza infection in birds: A challenge and opportunity for the poultry veterinarian. *Poultry Sci.,* 88: 842–846.

Capua, I. and D.J. Alexander. 2004. Avian influenza; recent developments. *Avian Pathol.*, 33(4): 393-404.

Capua, I., Marangon, S. 2007. The use of vaccination to combat multiple introductions of Notifiable Avian Influenza viruses of the H5 and H7subtypes between 2000 and 2006 in Italy. *Vaccine*, 25: 4987-4995.

Easterday, B.C., Hinshaw, V.S. and Halvorson, D.A. 1997. Avian influenza. In Diseases of Poultry Calnek, BW, HJ Barnes, CW Beard, LR McDougald and YM Saif. eds.. Dis. of Poultry, 10th ed. Iowa State University Press. Ames., pp: 583-605.

EFSA. 2008. Animal health and welfare aspects of avian influenza and the risk of its introduction into the EU poultry holdings. *EFSA J.*, 715: 1-161.

Elbers, A.R.W., Fabri, T.H.F., de Vries, T.S., de Wit, J.J., Pijpers, A. and Koch, G. 2004. 'The highly pathogenic avian influenza A. H7N7) virus epidemic in The Netherlands in 2003- Lessons learned from the first five outbreaks'; *Avian Dis.,* 48(3): 691–705.

El-Sayed, D.A.A., Abdou, A.M., Shalash, S.M.M., Safaa, H.M. and Riad, S.A. 2011. Productivity and Immune Response of Broiler Chickens Vaccinated with Different Avian Influenza Vaccines at One or Seven Days of Age; *Australian J. Basic and Appl. Sci.,* 5(10): 325-334. ISSN 1991-8178.

Gerlach, H. 1986. "Paramyxovirus". In Harrison, GJ; Harrison, LR. Ed), Clinical Avian Medicine and Surgery. Hiladelphia, WB Saunders Co; pp: 421-426.

Kawaoka, Y., Yamnikova, S., Chambers, T.M., Lvov, D.K. and Webster, R.G. 1990. Molecular characterization of a new hemagglutinin, subtype H14, of influenza A virus. *Virol.,* 179: 759-767.

Lee, C.W. and Suarez, D.L. 2005. Avian

influenza virus: Prospects for prevention and control by vaccination. *Animal Health Res. Rev.,* 6: 1-15.

Meleigy, M. 2007. Egypt battles with avian influenza. Lancet, 370: 553-554. Nasr, NEA., 2008. Studies on Avian Influenza in poultry; PhD Thesis, Faculty of Veterinary Medicine, Cairo University, Egypt.

Nwankiti, O.O., Ejekwolu, A.J., Ibrahim, I., Ndako, J.A., Echeonwu, G.O.N. 2010. Detection of serum antibody level against Newcastle disease in local Chickens in Bauchimetropolis, Bauchistate, Nigeria. *African J. Clin. Experimetal Microbiol.,* 11(2): 95-101.

Office International des Epizooties. OIE. 1996. Newcastle disease. In Manual of standards for diagnostic tests and vaccines, 3rd Ed. OIE, Paris, pp:161-169.

Oluwole, O.E., Emikpe, B.O. and Olugasa, B.O. 2012. Attitude of poultry farmers towards vaccination against newcastle disease and avian influenza in Ibadan, Nigeria. Sokoto. *J. Vet. Sci.,* 10(1): 5-12.

Phan, Q.M. 2010. Epidemiological Studies of Highly Pathogenic Avian Influenza in Vietnam, PhD Thesis, Institute of Veterinary, Animal and Biomedical Sciences Massey University Palmerston North, New Zealand, pp: 6-7.

Rohm, C.N., Zhou, J., Suss, J., Mackenzie and Webster, R.J. 1996. Characterization of a novel influenza hemagglutinin, H15: criteria for determination of influenza A subtype. *Virol.,* 217: 508-516.

Sood, R., Swarup, D., Bhatia, S., Kulkarni, D.D., Dey, S., Saini, M., Dubey, S.C. 2012. Antiviral activity of crude extracts of Eugenia jambolana Lam. against highly pathogenic avian influenza. H5N1) virus. *Indian J. Experimental Biol.,* 50: 179-186.

Swayne, D.E. 2009. Avian influenza vaccines and therapies for poultry. *Comp. Immunol. Microbiol. Infect. Dis.*, 32: 351-363.

Van den Berg, T., B. Lambrecht, S. Marché, M. Steensels, S. Van Borm, and M. Bublo, 2008. Influenza vaccines and vaccination strategies in birds. *Comp. Immunol. Microbiol. Infect. Dis.*, 31: 121-165.

How to cite this article:

Jenan N. Bazzaz, Ayoub A. Bazzaz, Nawal K. Shukrey and Noorhan A. Chelebi. 2016. Safety of Some Poultry Products against Avian Influenza Virus (AIV) and Newcastle Disease (ND) consumed within Erbil, Iraq. *Int.J.Curr.Microbiol.App.Sci.* 5(11): 854-859.
doi: http://dx.doi.org/10.20546/ijcmas.2016.511.097