

## DAFTAR PUSTAKA

- AAHL. 2004. Molecular diagnostic test available at Australia Animal Health Laboratory (AAHL). <http://www.csiro.au>.
- Akey, B.L. 2003. Low-pathogenicity H7N2 avian influenza outbreak in Virginia during 2002. *Avian Dis.* 47: 1099–1103.
- Alexander, D.J., Parsons, G., and Manvell, R.J. 1986. Experimental assessment of the pathogenicity of eight avian influenza a viruses of H5 subtype for chickens, turkeys, ducks and quail. *Avian Pathol.* 15: 647–662.
- Alexander, D.J. 2000. A review of avian influenza in different bird species. *Vet. Microbiol.* 74: 3-13.
- Alexander, D.J. 2007a. An overview of the epidemiology of avian influenza. *Vaccine.* 25: 5637-5644.
- Alexander, D.J. 2007b. Summary of avian influenza activity in Europe, Asia, Africa, and Australasia, 2002–2006. *Avian Dis.* 51: 161-166.
- Alexander, P.E., De, P., and Rave, S. 2009. Is H9N2 avian influenza virus a pandemic potential? *Can. J. Infect. Dis. Med. Microbiol.* 20: e35–e36.
- Almond, J.W. 1977. A single gene determines the host range of influenza virus. *Nature.* 270: 617-618.
- Altmuller, A., Kunerl, M., Muller, K., Hinshaw, V.S., Fitch, W.M., and Scholtissek, C. 1992. Genetic relatedness of the nucleoprotein (NP) of recent swine, turkey and human influenza a virus (H1N1) isolates. *Virus Res.* 22: 79–87.
- Asakuma, S., Akahori, M., Kimura, K., Watanabe, Y., Nakamura, T., Tsunemi, M., Arai, I., Sanai, Y., and Urashima, T. 2007. Sialyl oligosaccharides of human colostrum: changes in concentration during the first three days of lactation. *Biosci. Biotechnol. Biochem.* 71: 1447–1451.
- Bajpai, V.K., Rather, I.A., Majumder, R., Shukla, S., Aeron, A., Kim, K., Kang, S.C., Dubey, R.C., Maheshwari, D.K., Lim, J., and Park, Y-H. 2016. Exopolysaccharide and lactic acid bacteria: perception, functionality and prospects. *Bangladesh J. Pharmacol.* 11: 1-23.
- Bano, S., Naeem, K., and Malik, S.A. 2003. Evaluation of pathogenic potential of avian influenza virus serotype H9N2 in chickens. *Avian Dis.* 47: 817-822.
- Baratawidjaja, K.G., dan Rengganis, I. 2014. *Imunologi dasar 11<sup>th</sup> edition*. Badan Penerbit FKUI. Jakarta.
- Barnas, G.M., Hempleman, S.C., Harinath, P., and Baptiste, J.W. 1991. Respiratory system mechanical behavior in the chicken. *Respir. Physiol.* 84: 145–157.

- Baudin, F., Petit, I., Weissenhorn, W., and Ruigrok, R.W. 2001. In vitro dissection of the membrane and RNP binding activities of influenza virus M1 protein. *Virology*. 281: 102-108.
- Bezuidenhout, A.J. 2005. Light and electron microscopic study of the thoracic respiratory air sacs of the fowl. *Anat. Histol. Embryol*. 34: 185-191.
- Bienenstock, J., Johnston, N., and Perey, D.Y. 1973. Bronchial lymphoid tissue. I. morphologic characteristics. *Lab. Invest*. 28: 686-692.
- Bong, Y.J., Jeong, J.K., and Park, K.Y. 2013. Fermentation properties and health functionality improvement of kimchi by kimchi lactic acid bacteria starters. *J. Korean Soc. Food Sci. Nutr*. 42: 1717-1726.
- Bouhlal, R., Haslin, C., Chermann, J.C., Collic-Jouault, S., Siquin, C., Simon, G., Cerantola, S., Riadi, H., and Bourgougnon, N. 2011. Antiviral activities of sulfated polysaccharides isolated from *Sphaerococcus coronopifolius* (Rhodophyta, Gigartinales) and *Boergeseniella thuyoides* (Rhodophyta, Ceramiales). *Mar Drugs*. 9: 1187-1209.
- Butcher, G.D., and Miles, R.D. 2015. *Vaccine failure in poultry: Factors to Consider*. University of Florida. [<http://edis.ifas.ufl.edu/vm062>]. Diakses Oktober 2017.
- Capua, I., and Alexander, D.J. 2004. Avian influenza: recent developments. *Avian Pathol*. 33: 393-404.
- Capua, I., Cattoli, G., and Marangon, S. 2004. DIVA-a vaccination strategy enabling the detection of field exposure to avian influenza. *Dev. Biol. (Basel)*. 119: 229-233.
- Capua, I., and Maragon, S. 2007. The challenge of controlling notifiable avian influenza by means of vaccination. *Avian Dis*. 51: 317-322.
- Capua, I and Alexander, D.J. 2008a. Avian influenza vaccines and vaccination in birds. *Vaccine*. 26S: D70-D73.
- Capua, I and Alexander, D.J. 2008b. Ecology, epidemiology and human health implications of avian influenza viruses: why do we need to share genetic data? *Zoonoses Public Health*. 55: 2-15.
- CASERED (Indonesian Centre of Agricultural Socio-Economic Research and Development). 2004. Socio-economic impact assessment of the avian influenza crisis in poultry production systems in Indonesia, with particular focus on independent smallholders. *Final Report for FAO's TCP/RAS/3010 "Emergency Regional Support for Post Avian Influenza Rehabilitation"*.FAO, Rome.
- Carter, J., and Saunders, V. 2007. *Virology principles and applications*, John Wiley & Sons, P. 1-358.

- Cattoli, G., Drago, A., Maniero, S., Toffan, A., Bertoli, E., Fassina, S., Terregino, C., Robbi, C., Vicenzoni, G., and Capua, I. 2004. Comparison of three rapid detection systems for type A influenza virus on tracheal swabs of experimentally and naturally infected birds. *Avian Pathol.* 33: 432-437.
- Centre for Disease Control and Prevention (CDC). 2017. Influenza type A viruses. [<https://www.cdc.gov/flu/avianflu/influenza-a-virus-subtypes.htm>]. Diakses Februari 2018.
- Centre for Health Protection (CHP). 2017. Avian influenza affected areas and global statistics of avian influenza A (H5N1) as of August 2017. [[http://www.chp.gov.hk/files/pdf/global\\_statistics\\_avian\\_influenza\\_e.pdf](http://www.chp.gov.hk/files/pdf/global_statistics_avian_influenza_e.pdf)]. Diakses Agustus 2017.
- Chander, Y., Jindal, N., Sreevatsan, S., Stallknecht, D.E., and Goyal, S.M. 2013. Molecular and phylogenetic analysis of matrix gene of avian influenza viruses isolated from wild birds and live bird markets in the USA. *Influenza Other Respir. Viruses.* 7: 513–520.
- Chang, J.H., Shim, Y.Y., Cha, S.K., and Chee, K.M. 2010. Probiotic characteristics of lactic acid bacteria isolated from kimchi. *J. Appl. Microbiol.* 109: 220–230.
- Chang, J.Y., and Chang, H.C. 2011. Growth inhibition of foodborne pathogens by kimchi prepared with bacteriocin-producing starter culture. *J. Food Sci.* 76: M72–M78.
- Cheigh, H.S., and Park, K.Y. 1994. Biochemical, Microbiological, and Nutritional Aspects of Kimchi (Korean Fermented Vegetable Products). *Crit. Rev. Food Sci. Nutr.* 34: 175-203.
- Chen, C., Jiang, Z.-Y., Yu, B., Wu, X.-L., Dai, C.-Q., Zhao, C.-L., Ju, D.-H., and Chen, X.-Y. 2012. Study on the anti-H1N1 virus effects of quercetin and oseltamivir and their mechanism related to TLR7 pathway. *J. Asian Nat. Prod. Res.* 14: 877-885.
- Choi, H.J., Lee, N.K., and Paik, H.D. 2015. Health benefits of lactic acid bacteria isolated from kimchi, with respect to immunomodulatory effects. *Food Sci. Biotechnol.* 24: 783-789.
- Chon, H., Choi, B., Jeong, G., and Mo, I. 2008. Evaluation system for an experimental study of low pathogenic avian influenza virus (H9N2) infection in specific pathogen free chickens using lactic acid bacteria, *Lactobacillus plantarum* KFCC11389P. *Avian Pathol.* 37: 593–597.
- Chun, B-S., Wen, J., Ahn N-K., Shin, H., Park J-H., Lee, D., Jeong, H., and Han, J. 2007. Effect of culture materials from kimchi lactic acid bacteria on growth performance and prevention of PMWS in weaned pig. [[http://210.101.116.28/W\\_files/kiss61/1f800146\\_pv.pdf](http://210.101.116.28/W_files/kiss61/1f800146_pv.pdf)] Diakses, 5 Mei 2017.

- Codex Alimentarius Commission (Codex). 2001. Codex standard for kimchi. *Codex Standard 223*. Food and Agriculture Organization of the United Nations, Rome, Italy.
- Cross, K.J., Wharton, S.A., Shekel, J.J., Wiley, D.C., and Steinhauer, D.A. 2001. Studies on influenza haemagglutinin fusion peptide mutants generated by reverse genetics. *EMBO. J.* 20: 4432-4442.
- Damayanti, R., Dharmayanti, N.L.P.I., Indriani, R., Wiyono, A., and Darminto. 2004. Gambaran klinis dan patologi ayam yang terserang flu burung sangat patogenik (HPAI) di beberapa peternakan di Jawa Timur dan Jawa Barat. *Jurnal Ilmu Ternak dan Veteriner.* 9: 128-135.
- Damayanti, R., Dharmayanti, N.L.P.I., Indriani, R., Wiyono, A., and Adjid, R.M.A. 2005. Monitoring kasus penyakit avian influenza berdasarkan deteksi antigen virus subtype H5N1 secara imunohistokimia. *JITV.* 10: 322-330.
- Dharmayanti, N.L.P.I., Damayanti, R., Wiyono, A., Indriani, R., and Darminto. 2004. Identifikasi virus avian influenza isolat indonesia dengan reverse transcriptase-polymerase chain reaction (RT-PCR). *Jurnal Ilmu Ternak dan Veteriner.* 9: 136-142.
- Dharmayanti, N.L.P.I., Diwyanto, K., and Bahri, S. 2012. Mewaspadaai perkembangan avian influenza (AI) dan keragaman genetik virus AI/H5N1 di Indonesia. *Pengembangan Inovasi Pertanian.* 5: 124-141.
- Dimmock, N.J., Easton, A.J., and Leppard, K.N. 2007. *Introduction of modern virology 6th edition*. Blackwell Publishing. USA.
- Ditjen PKH. 2017. *Situasi kejadian avian influenza (AI) pada unggas kondisi s/d 31 agustus 2017*. [<http://ditjenpkh.pertanian.go.id/situasikejadian-avian-influenza-ai-pada-unggaskondisi-s-d-31-agustus-2017>]. Diakses pada 9 November 2017.
- Fagerland, J.A., and Arp, L.H. 1993. Distribution and quantitation of plasma cells, T lymphocyte subsets, and B lymphocytes in bronchus-associated lymphoid tissue of chickens: age-related differences. *Reg. Immunol.* 5: 28-36.
- Fang, L-Q., de Vlas, S.J., Liang, S., Looman, C.W.N., Gong, P., Xu. B., Yan, L., Yang, H., Richardus, J.H., Cao, and W.C. 2008. Environmental factors contributing to the spread of H5N1 avian influenza in Mainland China. *PLoS ONE.* 3: e2268.
- Fensterl, V., and Sen, G.C. 2009. Interferons and viral infections. *Biofactors.* 35: 14-20.
- Fereidouni, S.R., Harder, T.C., Gaidet, N., Ziller, M., Hoffmann, B., Hammoumi, S., Globig, A., and Starick, E. 2012. Saving resources: avian influenza

surveillance using pooled swab samples and reduced reaction volumes in real-time RT-PCR. *J. Virol. Methods*. 186:119-125.

Fiers, W., De Filette, M., Birkett, A., Neirynck, S., and Min Jou, W. 2004. A “universal” human influenza a vaccine. *Virus Res*. 103: 173–176.

Garcia-Robles, I., Akarsu, H., Muller, C.W., Ruigrok, R.W.H., and Baudin, F. 2005. Interaction of influenza virus proteins with nucleosomes. *Virology*. 332: 329-336.

Geneaid. 2017. Viral nucleic acid extraction kit II. <http://www.geneaid.com/sites/default/files/VR10.pdf>. (Diakses tanggal 27 Maret 2018)

Geurts van Kessel, C.H., Willart, M.A., van Rijt, L.S., Muskens, F., Kool, M., Baas, C., Thielemans, K., Bennett, C., Clausen, B.E., Hoogsteden, H. C., Osterhaus, A.D.M.E., Rimmelzwaan, G.F., and Lambrecht, B.N. 2008. Clearance of influenza virus from the lung depends on migratory Langerin+CD11b- but not plasmacytoid dendritic cells. *J. Exp. Med*. 205: 1621-1634.

Gharaibeh, S., Mahmoud, K., and Al-Natour, M. 2008. Field evaluation of maternal antibody transfer to a group of pathogens in meat-type chickens. *Poult. Sci*. 87: 1550-1555.

Gharaibeh, S., dan Mahmoud, K. 2013. Decay of maternal antibodies in broiler chickens. *Poult. Sci*. 92: 2333-2336.

Gomez-Puertas, P., Albo, C., Perez-Pastrana, E., Vivo, A., and Portela, A. 2000. Influenza virus matrix protein is the major driving force in virus budding. *J. Virol*. 74: 11538–11547.

Guan, Y., Shortridge, K.F., Krauss, S., Li, P.H., Kawaoka, Y., and Webster, R.G. 1996. Emergence of avian H1N1 influenza viruses in pigs in china. *J. Virol*. 70: 8041–8046.

Ha, B-J., Bae, D-J., Ku, C-S., Kim, C-H., Jang, D-I., and Sung, H-W. 2008. Anti-viral effect of *Lactobacillus plantarum* DC 412K isolated from Kimchi on the avian influenza virus. *Korean Society for Biotechnology and Bioengineering, Spring Conference and International Symposium 2008* pp 267-268.

Hahn, Y-S., Woo, K-J., Park, Y-H., and Lee, T-Y. 1997. The nature of viscous polysaccharide formed kimchi added sucrose. *J. Korean Soc. Food Sci. Nutr*. 26: 198-202.

Hall, D.C., Benigno, C., and Kalpravidh, W. 2006. *The impact of avian influenza on small and medium scale poultry producers in south east Asia (preliminary findings)*. Paper prepared for presentation at the American

Agricultural Economics Association Annual Meeting, Long Beach, California, July 23-26, 2006.

- Haq, K., Wootton, S.K., Barjesteh, N., Golovan, S., Bendall, A., and Sharif, S. 2015. Effects of interferon-gamma knockdown on vaccine-induced immunity against Marek's disease in chickens. *Can. J. Vet. Res.* 79: 1–7.
- Hama, Y., Kurokawa, M., Imakita, M., Yoshida, Y., Shimizu, T., Watanabe, W., and Shirasaki, K. 2009. Interleukin 12 is a primary cytokine responding to influenza virus infection in the respiratory tract of mice. *Acta. Virol.* 53: 233 – 240.
- Hamal, K.R., Burgess, S.C., Pevzner, I.Y., and Erf, G.F. 2006. Maternal antibody transfer from dams to their egg yolks, egg whites, and chicks in meat lines of chickens. *Poult. Sci.* 85: 1364-1372.
- Harder, T.C., and Werner, O. 2006. Avian influenza. in: *Influenza report*. Kamps, B.S., Hoffmann, C., and Preiser, W (Eds.). pp:1-47.
- Harutoshi, T. 2013. Exopolysaccharides of lactic acid bacteria for food and colon health applications. biochemistry, genetics and molecular biology. in: *lactic acid bacteria: r and d for food, health and livestock purposes*. Kongo M (ed). pp 222- 38.
- Haryanto, A., Andinita, D., Irianingsih, S.H., and Yudianingtyas, D.W. 2012. Diagnosis cepat virus avian influenza tipe A sub tipe H5 dari spesimen lapangan dengan metode onestep simplex RT-PCR. *Jurnal Kedokteran Hewan.* 6: 6-10.
- Hewajuli, D.A., and Dharmayanti, N.L.P.I. 2012. Sirkulasi virus flu burung sub tipe H5 pada unggas di Jawa Barat, Banten, dan Jawa Timur sepanjang tahun 2008-2009. *J. Vet.* 13(3): 293-302.
- Hinshaw, V.S., Webster, R.G., Bean, W.J., Downie, J., and Senne, D.A. 1983. Swine influenza like viruses in turkeys: potential source of virus for humans? *Science.* 220: 206–208.
- Hinshaw, V.S., Olsen, C.W., Dybdahlsissoko, N., and Evans, D. 1994. Apoptosis: a mechanism of cell killing by influenza a and b viruses. *J. Virol.* 68: 3667-3673.
- Holsinger, L.J., and Lamb, R.A. 1991. Influenza virus M2 integral membrane protein is a homotetramer stabilized by formation of disulfide bonds. *Virology.* 183: 32-43.
- Horimoto, T., and Kawaoka, Y. 2001, Pandemic threat posed by avian influenza a viruses. *Clin. Microbiol. Rev.* 14: 129-149.
- Huang, Y., Zhang, H., Li, X., Hu, S., Cai, L., Sun, Q., Li, W., Deng, Z., Xiang, X., Zhang, H., Li, F., and Gao, L. 2015. Detection and genetic characteristics



- of H9N2 avian influenza viruses from live poultry markets in Hunan province, China. *PLoS ONE*. 10: e0142584.
- Indriani, R., and Dharmayanti, N.L.P.I. 2012. *Antibody level of avian influenza subtype H5 in commercial broiler farm*. International Conference on Livestock Production and Veterinary Technology: 402-406.
- Jang, K.S., Kim, M.J., Oh, Y.A., Kim, I.D., No, H.K., and Kim, S.D. 1991. Effects of various sub-ingredients on sensory quality of Korean cabbage kimchi. *J. Korean Soc. Food Nutr.* 20: 233-240.
- Jang, D.I., and Lee, J.H. 2007. Natural anti-virus and composition comprising thereof. *Patent EP1781308A*. Inventors.
- Ji, Y., Kim, H., Park, H., Lee, J., Shin, H., Kim, B., Franz, C.M.A.P., and Holzapfel, W.H. 2013. Functionality and safety of lactic bacterial strains from Korean kimchi. *Food Control*. 31: 467-473.
- Jung, J.Y., Lee, S.H., Lee, H.J., Seo, H.Y., Park, W.S., and Jeon, C.O. 2012. Effect of *Leuconostoc mesenteroides* starter cultures on microbial communities and metabolites during kimchi fermentation. *Int. J. Food Microbiol.* 153: 378-387.
- Kalthoff, D., Globig, A., and Beer, M. 2010. (Highly pathogenic) Avian influenza as a zoonotic agent. *Vet. Microbiol.* 140: 237-245
- Kamboj, K., Vasquez, A., and Balada-Llasat, J.M. 2015. Identification and significance of *Weissella* species infections. *Front. Microbiol.* 6: 1204.
- Kandun, I.N., Tresnaningsih, E., Purba, W.H., Lee, V., Samaan, G., Harun, S., Soni, E., Septiawati, C., Setiawati, T., Sariwati, E., and Wandra, T. 2008. Factors associated with case fatality of human H5N1 virus infections in Indonesia: a case series. *Lancet*. 372: 744-749.
- Kassaa, I.A., Hober, D., Hamze, M., Chihib, N.E., and Drider, D. 2014. Antiviral potential of lactic acid bacteria and their bacteriocins. *Probiotics & Antimicro. Prot.* 6: 177-85.
- Kim, S., Shin, K., and Lee, H. 2004. Immunopotentiating activities of cellular components of *Lactobacillus brevis* FSB-1. *J. Korean Soc. Food Sci. Nutr.* 33: 1552-1559.
- Kim, J.M., Seo, H.N., Hwang, T.S., Lee, S.H., and Park, D.H. 2008. Characterization of exopolysaccharide (EPS) produced by *Weissella hellenica* Sskkimchi3 isolated from kimchi. *J. Microbiol.* 46: 535-541
- Kim, J.Y., and Lee, Y.S. 1997. The effects of kimchi intake on lipid contents of body and mitogen response of spleen lymphocytes in rats. *J. Korean Soc. Food Sci. Nutr.* 26: 1200-1207.

- Kobayashi, Y., Horimoto, T., Kawaoka, Y., Alexander, D.J., and Itakura, C. 1996. Pathological studies of chickens experimentally infected with two highly pathogenic avian influenza viruses. *Avian Pathol.* 25: 285–304.
- Kumar, A.S., Mody, K., and Jha, B. 2007a. Bacterial exopolysaccharides – a perception. *J. Basic. Microbiol.* 47: 103 – 117.
- Kumar, M., Chu, H.J., Rodenberg, J., Krauss, S., and Webster, R. G. 2007b. Association of serologic and protective responses of avian influenza vaccines in chickens. *Avian Dis.* 51: 481-483.
- Kumar, P., Khanna, M., Srivastava, V., Tyagi, Y.K., Raj, H.G., and Ravi, K. 2005. Effect of quercetin supplementation on lung antioxidants after experimental influenza virus infection. *Exp. Lung Res.* 31: 449–459.
- Kwak, S.H., Cho, Y.M., Noh, G.M., and Om, A.S. 2014. Cancer preventive potential of kimchi lactic acid bacteria (*Weissella cibaria*, *Lactobacillus plantarum*). *J. Cancer Prev.* 19: 253–258.
- Kwon, E.A., and Kim, M.H. 2007. Microbial evaluation of commercially packed kimchi products. *Food Sci. Biotechnol.* 16: 615–620.
- Lamb, R.A., Lai, C.J., and Choppin, P.W. 1981. Sequences of mRNA derived from genome RNA segment 7 of influenza virus: collinear and interrupted mRNAs code for overlapping proteins. *Proceedings of the National Academy of Sciences of the United States of America.* 78: 4170-4174.
- Lamb, R.A., Zebedee, S.L., and Richardson, C.D. 1985. Influenza virus M2 protein is an integral membrane protein expressed on the infected cell surface. *Cell.* 40: 627-633.
- Latham, T., and Galarza, J.M. 2001. Formation of wild-type and chimeric influenza virus-like particles following simultaneous expression of only four structural proteins. *J. Virol.* 75: 6154-6165.
- Lee, M-S., Chang, P-C., Shien, J-H., Cheng, M-C., and Shieh, H.K. 2001. Identification and subtyping of avian influenza viruses by reverse transcription-PCR. *J. Virol. Methods.* 97: 13–22
- Lee, Y.M., Kwon, M.J., Kim, J.K., Suh, H.S., Choi, J.S., and Song, Y.O. 2004. Isolation and identification of active principle in Chinese cabbage kimchi responsible for antioxidant activity. *Korean J. Food Sci. Technol.* 36: 129-133.
- Lee, D.Y., Kim, S.J., Cho, J.H., and Kim, J.H. 2008. Microbial population dynamics and temperature changes during fermentation of kjang kimchi. *J. Microbiol.* 46: 590–593.
- Lee, M.E., Jang, J.Y., Lee, J.H., Park, H.W., Choi, H.J., and Kim, T.W. 2015. Starter cultures for kimchi fermentation. *J. Microbiol. Biotechnol.* 25: 559–568.



- Lee, D-H., Fusaro, A., Song, C-S., Suarez, D.L., and Swayne, D.E. 2016. Poultry vaccination directed evolution of H9N2 low pathogenicity avian influenza viruses in Korea. *Virology*. 488: 225-231.
- Lim, C.T., Park, H.K., and Han, H.U. 1989. Reevaluation of isolation and identification of Gram positive bacteria in kimchi. *Korean J. Microbiol.* 27: 404–414.
- Lin, X., Wang, R., Zou, W., Sun, X., Liu, X., Zhou, L., Wang, S., and Jin, M. 2016. The influenza virus H5N1 infection can induce ROS production for viral replication and host cell death in A549 cells modulated by human Cu/Zn superoxide dismutase (SOD1) overexpression. *Viruses*. 8: 13.
- Liu, C., Eichelberger, M.C., Compans, R.W., and Air, G.M. 1995. Influenza type A virus neuraminidase does not play a role in viral entry, replication, assembly, or budding. *J. Virol.* 69: 1099– 1106.
- Liu, J., Yang, F., Ye, L.B., Yang, X.J., Timani, K.A., Zheng, Y., and Wang, Y.H. 2004. Possible mode of action of antiherpetic activities of a proteoglycan isolated from the mycelia of *Ganoderma lucidum* in vitro. *J. Ethnopharmacol.* 95: 265-72.
- Liu, W., Zou, P., Ding, J., Lu, Y., and Chen, Y.H. 2005. Sequence comparison between the extracellular domain of M2 protein human and avian influenza A virus provides new information for bivalent influenza vaccine design. *Microbes. Infect.* 7: 171–177.
- Liu, C., Zhang, A., Guo, J., Yang, J., Zhou, H., Chen, H., and Jin, M. 2012. Identification of human host proteins contributing to H5N1 influenza virus propagation by membrane proteomics. *J. Proteome Res.* 11: 5396–5405.
- Ma, Q.X., Jiang, W.M., Liu, S., Wang, S.C., Zhuang, Q.Y., Hou, G.Y., Liu, X.M., Sui, Z.H., and Chen, J.M. 2014. Subclinical highly pathogenic avian influenza virus infection in vaccinated chickens, China. *Emerg. Infect. Dis.* 20: 2152-2154.
- MacLachlan, N.J., and Dubovi, E.J. 2011. *Fenner's veterinary virology fourth edition*. Academic Press. USA.
- Mallick, A.I., Parvizi, P., Read, L.R., Nagy, E., Behboudi, S., and Sharif, S. 2011. Enhancement of immunogenicity of a virosome-based avian influenza vaccine in chickens by incorporating CpG-ODN. *Vaccine*. 29: 1657–1665.
- Malmgaard, L. 2004. Induction and regulation of IFNs during viral infections. *J. Interferon Cytokine Res.* 24: 439-454.
- Mahardika, I.G.N.K., Sukada, I.M., Antara, M.S., and Suartini, N.G.A.A. 2008. Motif sekuens asam amino pembentuk kantong pengikat Oseltamivir pada protein neuraminidase virus avian influenza (H5N1) asal manusia dan hewan di Indonesia. *J. Vet.* 9: 204-206.

- Martindah, E., Priyanti, A., and Nurhayati, I.S. 2007. Kajian pelaksanaan kebijakan pengendalian penyakit avian influenza di lapang. *Lokakarya Nasional Inovasi Teknologi Dalam Mendukung Usaha Ternak Unggas Berdaya Saing*. Bogor.
- Matsuzaki, C., Kamishima, K., Matsumoto, K., Koga, H., Katayama, T., Yamamoto, K., and Hisa, K. 2013. Immunomodulating activity of exopolysaccharide producing *Leuconostoc mesenteroides* strain NTM048 from green peas. *J. Appl. Microbiol.* 116: 980—989.
- McCown, M.F., and Pekosz, A. 2005. The influenza A virus M2 cytoplasmic tail is required for infectious virus production and efficient genome packaging. *J. Virol.* 79: 3595–3605.
- Mounts, A.W., Kwong, H., Izurieta, H.S., Ho, Y.Y., Au, T.K., Lee, M., Bridges, C.B., Williams, S.W., Mak, K.H., Katz, J.M., Thompson, W.W., Cox, N.J., and Fukuda, F. 1999. Case-control study of risk factors for avian influenza A (H5N1) disease, Hong Kong, 1997. *J. Infect. Dis.* 180: 505-508.
- Murphy, F.A., Gibbs, E.J.P., Horzinek, M.C., and Studdert, M.J. 2003. *Veterinary virology third edition*. Academic Press. USA.
- Mujiatun. 2009. *Deteksi keberadaan virus avian influenza pada DOC yang dilalulintaskan melalui bandara Soekarno Hatta*. Tesis. Institut Pertanian Bogor. Jawa Barat.
- Naffakh, N., Tomoiu, A., Rameix-Welti, M.A., and van der Werf, S. 2008. Host restriction of avian influenza viruses at the level of the ribonucleoproteins. *Annu. Rev. Microbiol.* 62: 403-424.
- Nakamura, T., Kawase, H., Kimura, H., Watanabe, Y., Ohtan, M., Arai, I., and Urashima, T. 2003. Concentrations of sialyloligosaccharides in bovine colostrum and milk during the prepartum and early lactation. *J. Dairy Sci.* 86: 1315–1320.
- Nayak, D.P., Hui, E.K-W., and Barman, S. 2004. Assembly and budding of influenza virus. *Virus Res*, 106: 147-165.
- Nganpiep, L. N., and Maina, J. N. 2002. Composite cellular defence stratagem in the avian respiratory system: Functional morphology of the free (surface) macrophages and specialized pulmonary epithelia. *J. Anat.* 200: 499-516.
- Oh, M.H., Lee, S.G., and Paik, S. 2010. Antiviral activity of *Lactobacillus spp.* and polysaccharide. *J. Bacteriol. Virol.* 140: 145-150.
- Ohshima, K., and Hiramatsu, K. 2000. Distribution of T-cell subsets and immunoglobulin-containing cells in nasal-associated lymphoid tissue (NALT) of chickens. *Histol. Histopathol.* 15: 713-720.

- Olsen, B., Munster, V.J., Wallensten, A., Waldenstrom, J., Osterhaus, A.D.M.E., and Fouchier, R.A. 2006. Global patterns of influenza A virus in wild birds. *Science*. 312: 384–388.
- O'Neill, R.E., Talon, J., and Palese, P. 1998. The influenza virus NEP (NS2 protein) mediates the nuclear export of viral ribonucleoproteins. *EMBO J.* 17: 288–296.
- Palese, P., and Shaw, M.L. 2007. Orthomyxoviridae: The Viruses and their replication, In: D.M. Knipe and P.M. Howley (eds), *Fields Virology 5th ed.* Lippincott Williams & Wilkins, Philadelphia 1647–1689.
- Pandey, R.P., Kim, D.H., Woo, J., Song, J., Jang, S.H., Kim, J.B., Cheong, K.M., Oh, J.S., and Sohng, J.K. 2018. Broad-spectrum neutralization of avian influenza viruses by sialylated human milk oligosaccharides: in vivo assessment of 3'-sialyllactose against H9N2 in chickens. *Scientific Reports* 8: 2563.
- Pantin-Jackwood, M.J., and Swayne, D.E. 2009. Pathogenesis and pathobiology of avian influenza virus infection in Bird. *Rev. Sci. Tech. Off. Epiz.* 28: 113-136.
- Park, M-K., Vu, N.G.O., Kwon, Y-M., Lee, Y-T., Yoo, S., Cho, Y-H., Hong, S-H., and Hwang, H.S. 2013. *Lactobacillus plantarum* DK119 as a probiotic confers protection against influenza virus by modulating innate immunity. *PLoS ONE*. 8: e75368
- Park, K.Y., Jeong, J.K., Lee, Y.E., and Daily, J.W. 2014. Health benefits of kimchi (Korean fermented vegetables) as a probiotic food. *J. Med. Food*. 17: 6–20.
- Perkins, L.E., and Swayne, D.E. 2003. Comparative susceptibility of selected avian and mammalian species to a Hong Kong-origin H5N1 high-pathogenicity avian influenza virus. *Avian Dis.* 47: 956-967.
- Pinto, L.H., Holsinger, L.J., and Lamb, R.A. 1992. Influenza virus M2 protein has ion channel activity. *Cell*. 69: 517-528.
- Poetri, O., Bouma, A., Classen, I., Koch, G., Soejoedono, R., Stegeman, A., and van Boven, M. 2011. A single vaccination of commercial broilers does not reduce transmission of H5N1 highly pathogenic avian influenza. *Vet. Res.* 42: 74.
- Rather, I.A., Choi, K-H., Bajpai, V.L., and Park, Y-H. 2015. Antiviral mode of action of *Lactobacillus plantarum* YML009 on Influenza virus H1N1. *Bangladesh J. Pharmacol.* 10: 475-482.
- Reese, S., Dalamani, G., and Kaspers, B. 2006. The avian lung-associated immune system: A review. *Vet. Res.* 37: 311-324

- Rho, J. B., Poo, H., Choi, Y. K., Kim, C. J., and Sung, M. H. 2009. New lactic acid bacteria having its inhibitory effect on avian influenza virus infection and composition containing the same. *United States Patent US 20120156172 A1*. Inventors.
- Ronohardjo, P. 1983. Penyakit cengesan selesma pada itik Tegal, Bali, dan Alabio. *Penyakit Hewan* 15: 61-71.
- Rossman, J.S., and Lamb, R.A. 2011. Influenza virus assembly and budding. *Virology*. 411: 229–236.
- Salter, A., Ni Laoi, B., and Crowley, B. 2011. Emergence and phylogenetic analysis of amantadine-resistant influenza a subtype H3N2 viruses in Dublin, Ireland, over Six Seasons from 2003/2004 to 2008/2009. *Intervirology*. 54: 305–315.
- Santhakumar, D., Rubbenstroth, D., Martinez-Sobrido, L., and Munir, M. 2017. Avian interferons and their antiviral effectors. *Front. Immunol.* 8: 49.
- Sawant, P.M., Verma, P.C., Subudhi, P.K., Chaturvedi, U., Singh, M., Kumar, R., and Tiwari, A.K. 2011. Immunomodulation of bivalent Newcastle disease DNA vaccine induced immune response by co-delivery of chicken IFN-gamma and IL-4 genes. *Vet. Immunol. Immunopathol.* 144: 36–44.
- Sawitri Siregar, E., Darminto., Weaver, J., and Bouma, A. 2007. The a vaccination programme in Indonesia. *Dev. Biol (Basel)*. 130: 151-158.
- Scanes, C.G. 2015. *Sturkie's avian physiology 6<sup>th</sup> edition*. Elseiver. UK.
- Schmitt, A.P., and Lamb, R.A. 2005. Influenza virus assembly and budding at the viral budozone. *Adv. Virus Res.* 64: 383–416.
- Scholtissek, C., Stech, J., Krauss, S., and Webster, R.G. 2002. Cooperation between the hemagglutinin of avian viruses and the matrix protein of human influenza A viruses. *J. Virol.* 76: 1781–1786.
- Schultz-Cherry, S., Krug, R.M., and Hinshaw, V.S. 1996. Influenza virus neuraminidase activates latent transformis growth factor beta. *J. Virol.* 70: 8624-8629
- Seo, B.J., Rather, I.A., Kumar, V.J.R., Choi, U.H., Moon, M.R., Lim, J.H., and Park, Y.H. 2012. Evaluation of *Leuconostoc mesenteroides* YML003 as a probiotic against low-pathogenic avian influenza (H9N2) virus in chickens. *J. Appl. Microbiol.* 113: 163–171.
- Setyawati, S. 2010. *Kajian epidemiologi virus avian influenza pada distribusi anak ayam umur satu hari*. Disertasi. Institut Pertanian Bogor. Jawa Barat.
- Sharon, N. 2006. Carbohydrates as future anti-adhesion drugs for infectious diseases. *Biochim. Biophys. Acta* 1760, 527–537.

- Shim, S-M., Kim, J.Y., Lee, S.M., Park, J-B., Oh, S.K., Kim, Y-S. 2012. Profiling of fermentative metabolites in kimchi: volatiles and non-volatiles organic acids. *J. Korean Soc. Appl. Biol. Chem.* 55: 463–469.
- Shin, K., Chae, O., Park, I., Hong, S., and Choe, T. 1998. Antitumor effects of mice fed with cell lysate of *Lactobacillus plantarum* isolated from Kimchi. *Korean J. Biotechnol. Bioeng.* 13: 357-363.
- Sims, L.D., Domench, J., Benigno, C., Kahn, S., Kamaya, A., Lubroth, J., Martin, V., and Roeder, P. 2005. Origin and evolution of highly pathogenic H5N1 avian influenza in Asia. *Vet Rec.* 157: 159–164.
- Smialek, M., Tykalowski, B., Stenzel, T., and Koncicki, A. 2011. Local immunity of the respiratory mucosal system in chickens and turkeys. *Pol. J. Vet. Sci.* 14: 291-297.
- Smith, G.J.D., Naipospos, T.S.P., Nguyen, T.D., Dejong, M.D., Vijaykrishna, D., Usman, T.B., Hassan, S.S., Nguyen, T.V., Da, o, T.V., Bui, N.A., Leung, Y.H.C., Cheung, C.L., Rayner, J.M., Zhang, L.J., Poon, L.L.M., Li, K.S., Nguyen, V.C., Hien, T.T., Farrar, J., Webster, R.G., Chen, H., Peiris, J.S.M., and Guan, Y. 2006. Evolution and adaptation of H5N1 influenza virus in avian and human hosts in Indonesia and Vietnam. *Virology.* 56: 45-53.
- Spackman, E., Senne, D.A., Myers, T.J., Bulaga, L.L., Garber, L.P., Perdue, M.L., Lohman, K., Daum, L.T., and Suarez, D.L. 2002. Development of a real-time reverse transcriptase PCR assay for type A influenza virus and The avian H5 and H7 hemagglutinin subtypes. *J. Clin. Microbiol.* 40: 3256–3260.
- Spackman, E., and Swaynes D.E. 2013. Vaccination of gallinaceous poultry for H5N1 highly pathogenic avian influenza: Current questions and new technology. *Virus Res.* 178: 121-132.
- Su, S., Chen, J., Cao, Z., Lai, A., Ke, C., Wu, J., Li, Y., Qi, W., and Zhang, G. 2013. Detection of antibodies against Avian influenza virus subtypes H7 and H9 among veterinarians in Guangdong province, China. *J. Clin. Microbiol.* 51: 4272-4274.
- Suarez, D.L., Perdue, M.L., Cox, N., Rowe, T., Bender, C., Huang, J., and Swayne, D.E. 1998. Comparisons of highly virulent H5N1 influenza a viruses isolated from humans and chickens from Hong Kong. *J. Virol.* 72: 6678-6688.
- Suarez, D.L., Lee, C.W., and Swayne, D.E. 2006. Avian influenza vaccination in North America: strategies and difficulties. *Dev. Biol (Basel).* 124: 117–124.
- Suarez, D.L. 2008. Influenza A Virus, In: Suarez D.L. (eds), *Avian influenza 1<sup>st</sup> ed.* Blacwell Publishing, UK p 3-22.

- Sun, Y., Pu, J., Jiang, Z., Guan, T., Xia, Y., Xu, Q., Liu, L., Ma, B., Tian, F., Brown, E.G., and Liu, J. 2010. Genotypic evolution and antigenic drift of H9N2 influenza viruses in China from 1994 to 2008. *Vet. Microbiol.* 146: 215–225.
- Susta, L., Cornax, I., Diel, D.G., Garcia, S.C., Miller, P.J., Liu, X., Hu, S., Brown, C.C., and Afonso, C.L. 2013. Expression of interferon gamma by a highly virulent strain of Newcastle disease virus decreases its pathogenicity in chickens. *Microb. Pathog.* 61-62: 73–83.
- Suzuki, Y. 2005. Review Sialobiology of influenza molecular mechanism of host range variation of influenza viruses. *Biol. Pharm. Bull.* 28: 300-408.
- Swayne, D.E. 1997. Pathobiology of H5N2 Mexican Avia influenza viruses for chickens. *Vet. Pathol.* 34: 557-567.
- Swayne, D.E., and Suarez, D. L. 2000. Highly pathogenic avian influenza. *Rev. Sci. Tech. Off. Int. Epiz.* 19: 463-482
- Swayne, D.E., and King, D.J. 2003. Avian Influenza and Newcastle disease. *JAVMA.* 222: 1534 – 1540
- Swayne, D.E. 2008. *Avian influenza*. Blackwell Publishing. USA.
- Swayne, D.E., and Halvorson, D.A. 2008. Influenza. *In diseases of poultry* (Y.M. Saif, J.R., Glisson, A.M., Fadly, L.R., McDougald & Nolan, L., eds). 12th Ed. Blackwell, Ames, Iowa, 153-184
- Swayne, D.E. 2012. Impact of vaccines and vaccination on global control of avian influenza. *Avian Dis.* 56: 818–828.
- Swayne, D.E., Suarez, D.L., Spackman, E., Jadhao, S., Dauphin, G., Kim-Torchetti, M., McGrane, J., Weaver, J., Deniels, P., Wong, F., Selleck, P., Wiyono, A., Indriani, R., Yupiana, Y., Sawitri Siregar, E., Prajitno, T., Smith, D., and Fouchier, R. 2015. Antibody titer has positive predictive value for vaccine protection against challenge with natural antigenic-drift variants of H5N1 high-pathogenicity avian influenza viruses from Indonesia. *J. Virol.* 89: 3746–3762.
- Tarigan, S. 2015. Infeksi subklinis *avian influenza* H5N1 pada peternakan ayam yang menerapkan program vaksinasi. *WARTAZOA.* 25: 75-84.
- Tian, S.F., Buckler-White, A.J., London, W.T., Reck, L.J., Chanock, R.M., and Murphy, B.R. 1985. Nucleoprotein and membrane protein genes are associated with restriction of replication of influenza A/Mallard/N.Y./78 virus and its reassortants in squirrel monkey respiratory tract. *J. Virol.* 53: 771–775.
- Toth, T.E., Pyle, R.H., Caceci, T., Siegel, P.B., and Ochs, D. 1988. Cellular defense of the avian respirator system: Influx and nonopsonic phagocytosis by



- respiratory phagocytes activated by *pasteurella multocida*. *Infect. Immun.* 56: 1171-1179.
- Trampel, D.W., Zhou, E.M., Yoon, K.J and Koehler, K.J. 2006. Detection of antibodies in serum and egg yolk following infection of chickens with an H6N2 avian influenza virus. *J. Vet. Diagn. Invest.* 18: 437–442.
- Tyasasmaya, T., Wuryastuty, H., Wasito, R., and Sievert, K. 2016. Avian influenza virus H5N1 remained exist in gastrointestinal tracts of house flies 24 hours post-infection). *J. Vet.* 17: 205-210.
- Vaidya, B., Cho, S-Y., Oh, K-S., Kim, S.H., Kim, Y.O., Jeong, E-H., Nguyen, T.T., Kim, S.H., Kim, I.S., Kwon, J., and Kim, D. 2016. Effectiveness of periodic treatment of quercetin against influenza a virus H1N1 through modulation of protein expression. *J. Agric. Food Chem*, 64: 4416–4425.
- Varki, A. 2009. *Essentials of glycobiology*, Cold Spring Harbor Laboratory Press.
- Vazquez, E., Santos-Fandila, A., Buck, R., and Rueda, R. 2017. Major human milk oligosaccharides are absorbed into the systemic circulation after oral administration in rats. *Br. J. Nutr* 117: 237-247.
- Vinderola, G., Perdigo´n, G., Duarte, J., Farnworth E., and Matar, C. 2006. Effects of the oral administration of the exopolysaccharide produced by *Lactobacillus kefirano-faciens* on the gut mucosal Community. *Cytokine* 36: 254–260
- Vervelde, L., and Kapczynski, D.R. 2017. The innate and adaptive immune response to avian influenza virus In Swayne D.E. *Animal influenza 2<sup>nd</sup> edition*. John Wiley & Sons, Inc. US.
- Villegas, P. 1998. Viral disease of the respiratory System. *Poult. Sci.* 77: 1143–1145
- Virgin, S. 2007. Pathogenesis of viral infection. *In fields virology*, 5th Ed., Vol. 1 (D.M. Knipe & P.M. Howley eds). Lippincott Williams & Williams, Philadelphia, PA, 328-388.
- Wan, Q.-F., Wu, L., Yang, M.-l., Ma, R., Liang, J., and Gu, L.-G. 2011. Effect of quercetin on caspase-3 of A549 cell induced by influenza virus H1N1. *Zhongguo Zhongyiyao Xinxizazhi*. 18: 42–44.
- Ward, P., Small, I., Smith, J., Suter, P., and Dutkowski, R. 2005. Oseltamivir (Tamiflu) and its potential for use in the event of an influenza pandemic. *J. Antimicrob. Chemother.* 55: i5-i21.
- Wasik, B.R., Barnard, K.N., and Parrish, C.R. 2016. Effects of sialic acid modifications on virus binding and infection. *Trends Microbiol.* 24: 991-1001.

- Wasito R., Wuryastuty, H., Tjahyowati, G., Irianingsih, S.H., Tyasasmaya, T., and Maes, R.K. 2014. Detection and differentiation of pathogenic H5 and H7 influenza A virus subtypes in Indonesian poultry Bay multiplex reverse transcription-polymerase chain reaction. *Biochem. Biotechnol. Res.* 2: 27-31.
- Wasito, R., Wuryastuty, H., Tjahyowati, G., Irianingsih, S.H., and Tyasasmaya, T. 2015. Multiplex reverse transcription-polymerase chain reaction untuk deteksi cepat virus flu burung H5N1. *J. Vet.* 16: 25-30.
- Webster, R.G., Laver, W.G., Air, G.M., and Schild, G.C. 1982. Molecular mechanisms of variation in influenza viruses. *Nature.* 296: 115– 121.
- Webster, R.G., Kawaoka, Y., and Bean, W.J. 1989. What is the potential of avirulent influenza viruses to complement a cleavable hemagglutinin and generate virulent strains? *Virology.* 171: 484–492.
- Webster, R.G., Bean, W.J., Gorman, O.T., Chambers, T.M., and Kawaoka, Y. 1992. Evolution and ecology of influenza A viruses. *Microbiol. Rev.* 56:152-179.
- Webster, R.G., Sharp, G.B., and Claas, E.C. 1995. Interspecies transmission of influenza viruses. *Am. J. Respir. Crit. Care Med.* 152: S25–S30.
- Weis, W., Brown, J.H., Cusack, S., Paulson, J.C., Skehel, J.J., and Wiley, D.C. 1988. Structure of The Avian Virus Haemagglutinin Complexed with its receptor, Sialic Acid. *Nature.* 333: 426-431.
- Werner, O., and Harder, T.C. 2006. Avian Influenza in Kamps, B.S., Hoffmann, C., Preiser, W. (eds.) *Influenza report 2006*, Flying Publishers, Paris accessed at [www.influenzareport.com](http://www.influenzareport.com).
- Wibawa, I.W.T. 2012. *Manifestasi subklinis avian influenza pada unggas: ancaman keselamatan dan penanggulangannya*. Orasi Ilmiah Guru Besar IPB. Bogor.
- Won, T.J., Kim, B., Song, D.S., Lim, Y.T., Oh, E.S, Lee, D.I., Park, E.S., Min, H., Park, S.Y., and Hwang, K.W. 2011. Modulation of Th1/Th2 balance Bay Lactobacillus strains isolated from kimchi via stimulation of macrophage cell line J774A.1 in vitro. *J. Food Sci.* 76: H55-H61.
- World Organization for Animal Health (OIE). 2005. Avian influenza. In: *Manual of diagnostics tests and vaccines for terrestrial animals*, Chapter 2.7.12. World Organization of Animal Health: Paris, France.
- World Organization of Animal Health (OIE). 2010. *High pathogenicity avian influenza*. <http://oie.int> (Diakses Agustus 2017).
- World Organization of Animal Health (OIE). 2013. *Vaccination as a control tool against HPAI*. [<https://www.oie.int/doc/ged/D12944.PDF>]. Diakses November 2017.

- World Organization of Animal Health (OIE). 2015. Avian influenza (Infection with avian influenza viruses) In: *OIE terrestrial animals*, Chapter 2.3.4. World Organization of Animal Health: Paris, France
- World Health Organization (WHO). 2017. *Epidemiological and virological updates on influenza circulation*. [http://extranet.wpro.who.int/influenzaupdate/Avian]. Diakses Agustus 2017.
- Wuryastuty, H., and Wasito, R. 2013. Identifikasi molekuler virus avian influenza a pada lalat rumah (*Musca domestica Linnaeus*) yang diperoleh dari beberapa peternakan ayam yang berbeda di indonesia. *JSV*. 31: 1-7.
- Xiaorong, P., Haibo, W., Xiuming, P., and Nanping, W. 2015. Molecular phylogeny and evolutionary dynamics of matrix gene of avian influenza viruses in China. *Infect. Genet. Evol.* 34: 344-51.
- Xiong, X., McCauley, J.W., and Steinhauer, D.A. 2014. Receptor binding properties of the influenza virus hemagglutinin as a determinant of host range. *Curr. Top. Microbiol. Immunol.* 385, 63–91.
- Yang, E.-J., Kim, S.-I., Park, S.-Y., Bang, H.-Y., Jeong, J.H., So, J.-H., Rhee, I.-K., and Song, K.-S. 2012. Fermentation enhances the in vitro antioxidative effect of onion (*Allium cepa*) via an increase in quercetin content. *Food Chem. Toxicol.* 50: 2042–2048.
- Ye, Z., Liu, T., Offringa, D.P., McInnis, J., and Levandowski, R.A. 1999. Association of influenza virus matrix protein with ribonucleoproteins. *J. Virol.* 73: 7467-7473.
- Yu, G., Wang, A., Tang, Y., and Diao, Y. 2017. Vertical Transmission of H9N2 Avian Influenza Virus in Goose. *Front. Microbiol.* 8:1559.
- Yuk, S.S., Lee, D.H., Park, J.K., Tseren-Ochir, E.O., Kwon, J.Y., Lee, J.B., Park, S.Y., Choi, I.S., and Song, C.S. 2016. Pre-immune state induced by chicken interferon gamma inhibits the replication of H1N1 human and H9N2 avian influenza viruses in chicken embryo fibroblasts. *Virol. J.* 13: 71.
- Yun, J.W., Kang, S.C., and Song, S.K. 1996. Mannitol accumulation uring fermentation of kimchi. *J. Ferment. Bioeng.* 81: 279–280.
- Yuwono, T. 2006. *Teori dan aplikasi Polymerase Chain Reaction*. Penerbit ANDI. Yogyakarta.
- Ziegler, A.F., Davison, S., Acland, H., and Eckroade, R.J. 1999. Characteristics of H7N2 (nonpathogenic) avian influenza virus infections in commercial layers, in Pennsylvania, 1997–98. *Avian Dis.* 43: 142–149.