

## DAFTAR PUSTAKA

- Abdel-Fattah, S.A., EI-Sanhoury, M.H., EI-Mednay, N.M. and Abdul-Azeem, F. 2008. Thyroid activity of broiler chicks fed supplemental organic acids. *Int. J. Poul. Sci.*, 7: 215-222.
- Abdel-Raheem, S.M., Abd-Allah, S.M. and Hassanein, K.M. 2012. The effects of prebiotic, probiotic and synbiotic supplementation on intestinal microbial ecology and histomorphology of broiler chickens. *Int. J. Agr. Vet. and Med. Sci.*, 6(4): 277-289.
- Abdelqader, A., Irshaid, R. and Al-Fataftah, A.R. 2013. Effects of dietary probiotic inclusion on performance, eggshell quality, cecal microflora composition, and tibia traits of laying hens in the late phase of production. *Trop. Anim. Health and Prod.*, 45(4): 1017-1024.
- Abdel-Raheem, S.M. and Abd-Allah, S.M.S. 2011. The Effect of Single or Combined Dietary Supplementation of Mannan Oligosaccharide and Probiotics on Performance and Slaughter Characteristics of Broilers. *Int. Jour. Poult. Sci.* 10(11): 854-862.
- Abdisa, T. and Tagesu, T. 2017. Review on Newcastle Disease of Poultry and its Public Health Importance. *J. Vet. Sci. Technol.* 8: 441.
- Abe, F., Ishibashi, N and Shimamura, I. 1995. Effect of administration of bifidobacteria and lactic acid bacteria to newborn calves and piglets. *J. Dairy Sci.* 78: 2838-2846.
- Adil, S., Banday, T., Bhat, G.A., Mir, M.S. and Rehman, M. 2011. Effect of Dietary Supplementation of Organic Acids on Performance, Intestinal Histomorphology, and Serum Biochemistry of Broiler Chicken. *Vet. Med. Int.*, 2010: 479485.
- Agrawal, R., Hirpurkar, S.D., Sannat, C. and Gupta, A.K. 2016. Comparative study on immunoglobulin Y transfer from breeding hens to egg yolk and progeny chicks in different breeds of poultry. *Vet. World*, 9(4): 425-431.
- Agustina, L. 2006. *Penggunaan Ramuan Herbal sebagai Feed Additive untuk Meningkatkan Performans Broiler*. Prosiding Lokakarya Nasional Inovasi Teknologi dalam Mendukung Usaha Ternak Unggas Berdaya Saing, Bogor: Pusat Penelitian dan Pengembangan Peternakan.
- Ahmad, I. 2006. Effect of Probiotics on Broilers Performance. *Int. J. Poult. Sci.* 5(6): 593-597.

- Ahmed, S. T., Islam, M. M., Mun, H.-S., Sim, H.-J., Kim, Y.-J. and Yang, C.J. 2014. Effects of *Bacillus amyloliquefaciens* as a probiotic strain on growth performance, cecal microflora, and fecal noxious gas emissions of broiler chickens. *Poult. Sci.* 93(8): 1963–1971.
- Al-Natour, M.Q., Ward, L.A., Saif, Y.M., Stewart, B. and Keck, L.D. 2004. Effect of different levels of maternally derived antibodies on protection against infectious bursal disease virus. *Avian Dis.*, 48: 177-182.
- Alam, M.J., Howlader, M.A.R., Pramanik, M.A.H. and Haque, M.A. 2003. Effect of Exogenous Enzyme in Diet on Broiler Performance. *Int. J. Poult. Sci.* 2(2): 168-173.
- Alcicek, A., Bozkurt, M. and Cabuk, M. 2004. The effect of a mixture of herbal essential oils, an organic acid or a probiotic on broiler performance. *South Af. Jour. Anim. Sci.* 34(4).
- Alexander, D.J. and Allan, W.H. 1974. Newcastle disease virus pathotypes. *Av. Pathol.* 3: 269-278.
- Alexander, D.J. 1998. *Newcastle disease and other avian paramyxoviruses. In: A laboratory manual for the isolation, identification and characterization of avian pathogens*, ed. Swayne, D.E., Glisson, J.R., Jackwood, M.W., et al., 4th ed., pp. 156-163. American Association of Avian Pathologists, Kenneth Square, IA.
- Alexander, D.J. 2003. *Newcastle disease, other avian paramyxoviruses, and pneumovirus infection. In: Disease of poultry*, ed. Shaif YM, Barnes HJ, Glisson JR, et al., 12th ed., pp. 75-100. Blackwell, Oxford, UK.
- Alexander, D.J. 2003. Newcastle disease. *In: Disease of Poultry 11th Ed.*. SAIF, Y.M. (Ed.). Iowa State: University Press. Amess. pp. 64 – 87.
- Alexander, D.J., Bell, J.G. and Alders, R.G. 2004. *A Technology Review: Newcastle Disease. With Special Emphasis on its Effect on Village Chickens*. FAO Animal Production and health Paper (FAO).
- Alexander, D.J. 2009. *Newcastle Disease: OIE Terrestrial Manual*.
- Alexopoulos, C., Georgoulakis, I., Tzivara, A., Kritas, S., Siochu, A. and Kyriakis, S. 2004. Field evaluation of the efficacy of a probiotic containing *Bacillus licheniformis* and *Bacillus subtilis* spores, on the health status and performance of sows and their litters. *Journal of Animal Physiology and Animal Nutrition*, 88 (11-12): 381–392.

- Alkhalif, A., Alhaj, M. and Al-Homidan, I. 2010. Influence of Probiotic Supplementation on immune Response of Broiler Chicks. *Egypt Poult. Sci.* 30(1): 271-280.
- Allan, W.H., Lancaster, J.E. and Toth, B. 1978. *Newcastle disease vaccines their production and use*. FAO Animal Production and Health Series No.10. Food and Agriculture Organization of the United Nations, Rome.
- Alter, G. and Altfeld, M. 2006. NK cell function in HIV-1 infection. *Curr. Mol. Med.*, 6: 621-629.
- Amanu, S. dan Rohi, O.K. 2005. Studi Serologis Dengan Uji Hambatan Hemaglutinasi Terhadap Angsa Yang Dapat Bertindak Sebagai Pembawa Newcastle Disease di D.I. Yogyakarta. *Jurnal Sain Vet.* 23(1): 2407-3733.
- Angel, R., Dalloul, R.A. and Doerr, J. 2005. Performance of broiler chickens fed diets supplemented with a direct-fed microbial. *Poult. Sci.* 84: 1222–1231.
- Angulo, F.J., Nunnery, J.A. and Blair, H.D. 2004. Antimicrobial resistance in zoonotic enteric pathogens. *Rev. Sci. Tech. Off. Int. Epiz.* 23(2): 485-496.
- Anonim. 2006. *Manajemen broiler modern: Kiat-kiat memperbaiki FCR*. Technical Service dan Development Departement, Jakarta.
- Anonim. 2012. *Indeks Obat Hewan Indonesia*, Edisi VIII. Kementerian Pertanian, Direktorat Jenderal Peternakan dan Kesehatan Hewan. Halaman 447-504.
- Armando R.2009. *Memproduksi minyak atsiri berkualitas*. Penebar Swadaya. Jakarta.
- Attia, Y.A., Zeweil, H.S., Alsaffar, A.A. and El-Shafy, A.S. Effect of non-Antibiotic Feed Additive to Flavomycin on Productivity, Meat Quality and Blood Parameters in Broiler. *Arch.Geflügelk.* 75(1): 40–48.
- Badan Standarisasi Nasional (BSN). 1995. SNI 01-3924-1995. Karkas ayam Ayam Pedaging. Badan Standarisasi Nasional. Jakarta.
- Badan Standarisasi Nasional (BSN). 1997. SNI 01-4869-1997. Potongan Karkas Broiler. Badan Standarisasi Nasional. Jakarta.

- Bai, S., Wu, A., Ding, X., Lei, Y., Bai, J., Zhang, K. and Chio, J. 2013. Effects of probiotic-supplemented diets on growth performance and intestinal immune characteristics of broiler chickens. *Poultry Sci.* 92(3): 663-670.
- Beard, C.W. and Hanson, R.P. 1984. *Newcastle disease*. In: Hofstad, M.S., Barnes, H.J., Calnek, B.W., Reid, W.M. and Yoder, H.W. (eds.), *Diseases of Poultry*, 8th edn. Iowa State University Press: Ames, IA, USA, pp: 452-470.
- Bell, D. and Weaver, G. 2002. *Commercial Chicken Meat and Egg*. Kluwer Academic Publishers, United States of America.
- Bitterncourt, L.C., da Silva, C.C., Garcia, P.D.S.R., Donato, D.C.Z., de Albuquerque, R. and Araújo, L.F. 2011. Influence of a probiotic on broiler performance. *R. Bras. Zootec.*, 40(12): 2739-2743.
- Bogaard, V.D., Bruinsma, A.E. and Stobberingh, E.E . 2000. The effect of banning avopracin on VRE carriage in the Netherlands (five abattoirs) and Sweden. *J. Antimicrob. Chemother.* 46 (1): 146-148.
- Bray, J.L. 2008. The Impacts on broiler performance and yield by removing antibiotic growth promoters and an evaluation of potential alternatives. Dissertation. Texas A&M University. Austin.
- Brisbin, J.T., Zhou, H., Gong, J., Sabour P., Akbari M.R., Haghighi H.R., Yu H., Clarke A., Sarson A.J. and Sharif, S. 2008. Gene expression profiling of chicken lymphoid cells after treatment with *Lactobacillus acidophilus* cellular components. *Dev. Comp. Immunol.*, 32:563-574.
- Budiansyah. 2004. *Pemanfaatan Probiotik dalam Meningkatkan Penampilan Produksi Ternak Unggas*. Prog. Pasca Sarjana Institut Pertanian Bogor: Bogor.
- Burleson, F.G., Thomas, M.C. and Danny, L.W. 1992. *Virology A Laboratory Manual*. Academic Press Inc., San Diego. 45-52.
- Butaye, P., Devriese, L.A., and Haesebrouck, F. 2003. Antimicrobial growth promoters used in animal feed: effects of less well known antibiotics on gram- positive bacteria. *Clin. Microbiol. Rev.* 16: 175–188.
- Cahyono, B. 2004. *Cara Meningkatkan Budidaya Ayam Ras Pedaging (Broiler)*. Pustaka Nusatama, Yogyakarta.
- Castanon, J.I.R. 2007. Review: history of the use of antibiotic as growth promoters in European poultry feeds. *Poult. Sci.* 86: 2466–2471.

- Capua, I. and Alexander, D.J. 2009. *Avian Influenza and Newcastle Disease a Field and Laboratory Manual*. Milan: Springer-Verlag.
- Chang, J.S., Wang, K.C., Yeh, C.F., Shieh, D.E. and Chiang, L.C. 2013. Fresh ginger (*Zingiber officinale*) has anti-viral activity against human respiratory syncytial virus in human respiratory tract cell lines. *J. Ethnopharmacol.*, 145: 146-151.
- Chichlowski, M., Croom, J., McBride, B.W., Havenstein, G.B. and Koci, M.D. 2007. Metabolic and Physiological Impact of Probiotics or Direct-Fed-Microbials on Poultry: A Brief Review of Current Knowledge. *International Journal of Poultry Science*, 6(10): 694-704.
- Chitra, P., Mohan, B. and Vishwanathan, K. 2004. Effect of Probiotic with Ascorbic Acid on Growth Performance of Broilers in the Summer Season. *Indian Journal of Poultry Science*, 39(3): 281-284.
- Churchill, M., Chadburn, A., Bilinski, R.T. and Bertagnolli, M.M. 2000. Inhibition of intestinal tumors by curcumin is associated with changes in the intestinal immune cell profile. *J. Surg. Res.*, 89: 169-175.
- Chowdhury, R., Islam, K.M.S., Khan, M.J., Karim, M.R., Haque, M.N., Khatun, M.E. and Pesti, G.M. 2009. Effect of citric acid, avilamycin, and their combination on the performance, tibia ash, and immune status of broilers. *Poult. Sci.*, 88(8): 1616-1622.
- Ciriaco, E., Píñera, P.P., Díaz-Esnal, B. and Laurà, R. 2003. Agerelated changes in the avian primary lymphoid organs (thymus and bursa of fabricius). *Microsc. Res. Tech.* 62: 482-487.
- Cobb-Vantress. 2015. Broiler Performance camp; Nutrition Supplement. Cobb Vantress 500.
- Cosset, F.L., Bouquet, J.F., Drynda, A., Chebloune, Y., Rey-Senelonge, A., Kohen, G., Nigon, V.M., Desmettre, P. and Verdier, G. 1991. Newcastle Disease virus (NDV) vaccine based on immunization with avian cells expressing the NDV-hemagglutinin-neuraminidase glycoprotein. *Virology*. 185: 862-866.
- Cowieson, A.J. and Adeola, O. 2005. Carbohydrases, proteases and phytase have an additive beneficial effect in nutritionally marginal diets for broiler chicks. *Poult. Sci.*, 84: 1860-1867.
- Cutting, J.A. and Roth, T.F. 1973. Changes in specific sequestration of protein during transport into the developing oocyte of the chicken. *Biochim. Biophys. Acta.*, 298: 951-955.

- Czerwiński, J., Højberg, O., Smulikowska, S., Engberg, R.M. and Mieczkowska, A. 2012. Effects of sodium butyrate and salinomycin upon intestinal microbiota, mucosal morphology and performance of broiler chickens. *Arch. Anim. Nutr.*, 66(2): 102-116.
- Dallout, R.A., Lillehoj, H.S., Shellem, T.A. and Doerr, J.A. 2003. Enhanced mucosal immunity against *Eimeria acervulina* in broilers fed a *Lactobacillus*-based probiotic. *Poultry Science*, 82: 62-66.
- Darmawi, Fakhurrazi, Wiliana, Dewi, M., Abrar, M., Jamin, F. dan Manaf, Z.H. 2015. Deteksi Antibodi Serum Ayam Kampung (*Gallus domesticus*) Terhadap Virus Newcastle Disease Di Kota Banda Aceh. *J. Med. Vet.* 9(1): 0853-1943.
- Daskiran, M., Onol, A. G., Cengiz, O., Unsal, H., Turkyilmaz, S., Tatli, O. and Sevim, O. 2012. Influence of dietary probiotic inclusion on growth performance, blood parameters, and intestinal microflora of male broiler chickens exposed to posthatch holding time. *J. App. Poult. Res.* 21(3): 612-622.
- Diarra, M.S. and Malouin, F. 2014. Antibiotics in Canadian poultry productions and anticipated alternatives. *Front. Microbiol.* 5: 282.
- Diel, D.G., da Silva, L.H., Liu, H., Wang, Z., Miller, P.J. and Afonso, C.L. 2012. Genetic diversity of avian paramyxovirus type 1: proposal for a unified nomenclature and classification system of Newcastle disease virus genotypes. *Infect. Genet. Evol.* 12: 1770-1779.
- Dimitrov, K.M., Afonso, C.L., Yu, Q. and Miller, P.J. 2016. Newcastle disease vaccines- A solved problem or a continuous challenge? *Vet. Microbiol.* 206: 126-136.
- Dortmans, J.C.F.M., Koch, G., Rottier, P.J.M and Peeters, B.P.H. 2011. Virulence of Newcastle disease virus: What is known so far?. *Vet. Res.*, 42: 122.
- Ebrahimi, H., Rahimi, S., Khaki, P., Grimes, J.L. and Kathariou, S. 2016. The effects of probiotics, organic acid, and a medicinal plant on the immune system and gastrointestinal microflora in broilers challenged with *Campylobacter jejuni*. *Turk. J. Vet. Anim. Sci.*, 40: 329-336.
- Edjeng, S. dan Kartasudjana, R. 2006. *Manajemen Ternak Unggas*. Penebar Swadaya, Jakarta.
- Emadi, M. and Kermanshahi, H. 2007. Effect of turmeric rhizome powder on immunity responses of broiler chickens. *J. Anim. Vet. Advan.*, 6: 833-836.

- Ensminger, M. E. 1992. *Poultry Science*. 3<sup>rd</sup> Edition. Interstate Publisher. Inc., Danville.
- Erganis, O. and Ucan, U.S. 2003. Evaluation Of Three Different Vaccination Regimes Against Newcastle Disease in Central Anatolia. *Turk. J. Vet. Anim. Sci.* 27: 1065-1069.
- Etriwati, Ratih, D., Handharyani, E., Setiyaningsih, S. 2017. Pathology and immunohistochemistry study of Newcastle disease field case in chicken in Indonesia. *Vet. World*, 10(9): 1066-1071.
- Ezeibe, M.C.O., Nwokike, E.C., Eze, J.I. and Eze, I.C. 2006. Detection and characterization of Newcastle disease virus from feaces of healthy frre-roaming chickens in Nsukka, *Niger. Trop. Vet.*, 24(4): 76-80.
- Ezeibe, M.C., Okoye, J.A., Ezeala, I.E., Mbuko, I.J., Ngene, A.A. 2014. Comparison of use of agglutination of mammalian erythrocytes plus heat stability test and use of agglutination of mammalian erythrocytes plus erythrocyte elution time to characterize isolates of Newcastle disease virus. *Brit. Microb. Res. J.*, 4(7): 730.
- Fadillah, R., Polana, A., Alam, S. dan Parwanto, E. 2007. *Sukses Beternak Ayam Broiler*. Agromedia Pustaka, Jakarta.
- Fascina, V.B., Sartori, J.R., Gonzales, E., Carvalho, F.B., Souza, I.M.G.P., PolycarpoI, G.V., Stradiotti, A.C. and Pelícia, V.C. 2012. Phytogetic additives and organic acids in broiler chicken diets. *R. Bras. Zootec.*, 41(10): 2189-2197.
- Fascina, V.B., Pasquali, G.A.M., Carvalho, F.B., Muro, E.M., Vercese, F., Aoyagi, M.M., Pezzato, A.C., Gonzales, E. and Sartori, J.R. 2017. Effects of Phytogetic Additives and Organic Acids, alone or in combination, on the Performance, Intestinal Quality and Immune Responses of Broiler Chickens. *Brazil. J. Poult. Sci.*, 19(3): 497-508.
- Fasina, Y.O., Newman, M.M., Stough, J.M., Liles, M.R. 2016. Effect of *Clostridium perfringens* infection and antibiotic administration on microbiota in the small intestine of broiler chickens, *Poult. Sci.*, 95(2): 247-260.
- Fathi, M.M., Ebeid, T.A., Al-Homidan, I., Soliman, N.K. and Abou-Emera, O.K. 2017. Influence of Probiotic Supplementation on Immune Response in Broilers Raised Under Hot Climate. *Brit. Poult. Sci.* 58(5): 512-516.

- FAO/WHO. 2001. *Health and nutritional properties of probiotics in food including powder milk with live lactic acid bacteria*. Food and Agriculture Organization of the United Nations.
- Fritts, C.A. and Waldroup, P.W.2003. Evaluation of bBo-Mos<sup>®</sup> mannan-oligosaccharide as a replacement for growth promoting antibiotics in diets for turkeys. *Internat. J. Poult. Sci.* 2: 19-22.
- Fuller, R. 1991. Probiotics in human medicine. *Gut*, 32: 439–442.
- Fuller, R.1992. *Probiotics the Scientific Basis*. Chapman and Hall, London.
- Fuller, R. 1997. *Probiotic 2. Application and Practical Aspects*. 1st. Ed. Chapman and Hall, London.
- Fung-Leung, W.P., Schilham, M.W., Rahemtulla, A., Kündig, T.M., Vollenweider, M., Potter, J., van Ewijk, W. and Mak, T.W. 1991. CD8 is needed for development of cytotoxic T cells but not helper T cells. *Cell*. 65: 443-449.
- Gao, F., Jiang, Y., Zhou, G.H. and Han, Z.K. 2004. Effects of non-starch polysaccharide enzyme supplements on the growth, immune function and gastrointestinal microflora of chickens. *Chin. J. Vet. Sci.* 24:501-503.
- Ganesh, C.J. and Bharat, B.A. 2007. “Spicing Up” of the immune system by curcumin. *J. Clin. Immun.*, 27: 19-35.
- Ghadban, G.S. 2002. Probiotics in broiler production- a review. *Archiv. fur Geflugelkunde*. 66(2): 49-58.
- Ghazalah, A.A., Atta, A.M., Elkloub, K., Moustafa, M.EL. and Riry, F.H. 2011. Effect of Dietary Supplementation of Organic Acids on Performance, Nutrients Digestibility and Health of Broiler Chicks. *Int. Jour. Poult. Sci.* 10(3): 176-184.
- Giannenas, I., Papadopoulos, E., Tsalie, E., Triantafillou, E., Henikl, S., Teichmann, K. and Tontis, D. 2012. Assessment of dietary supplementation with probiotics on performance, intestinal morphology and microflora of chickens infected with *Eimeria tenella*. *Vet. Par.* 188(1/2): 31–40.
- Gibson, G.R., Roberfroid, M.B. 1995. Dietary modulation of human colonic microbiota: introducing the concept of prebiotics. *J. Nutr.* 125: 140–142.

- Gomathi, G., Senthilkumar, S., Natarajan, A., Amutha, R. and Purushothaman, M.R. 2018. Effect of dietary supplementation of cinnamon oil and sodium butyrate on carcass characteristics and meat quality of broiler chicken. *Vet. World*, 11(7): 959-964.
- Grimes, S.E. 2002. A Basic Laboratory Manual for the Small-Scale Production and Testing of I-2 Newcastle Disease Vaccine. Regional Office for Asia and the Pacific (RAP) publication, Thailand.
- Gupta, R.B. 2004. Effect of Cyclodextrins on the Flavor of Goat Milk and its Yoghurt. *Thesis*. Auckland University of Technology. Auckland.
- Gusils, C.S., Gonzalez and Oliver, G. 1999. Some Probiotic Properties of Chicken *Lactobacilli*. *Can. J. Microbiol.* 45: 981-987.
- Hao, H., Cheng, G., Iqbal, Z., Ai, X., Hussain, H., Huang, L., Dai, M., Wang, Y., Liu, Z. and Yuan, Z. 2014. Benefits and risks of antimicrobial use in food producing animals. *Front. Microbiol.* 5: 288.
- 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.
- Hill, C., Guarner, F., Reid, G., Gibson, G. R., Merenstein, D. J., Pot, B. 2014. Expert consensus document. The International Scientific Association for Probiotics and Prebiotics consensus statement on the scope and appropriate use of the term probiotic. *Nat. Rev. Gastro. Hepato.* 11: 506-514.
- Hofacre, C.L., Mathis, G.F., Miller, S.H. and LaVorgna, M.W. 2007. Use of Bacitracin and Roxarsone to Reduce *Salmonella* Heidelberg Shedding Following a Necrotic Enteritis Challenge Model. *J. Appl. Poult. Res.*, 16:275-279.
- Huang, Y., Wan, H.Q., Liu, H.Q., Wu, Y.T., and Liu, X.F. 2004. Genomic sequence of an isolate of Newcastle disease virus isolated from an outbreak in geese: a novel six nucleotide insertion in the non-coding region of the nucleoprotein gene. Brief report. *Arch. Virol.* 149: 1445–1457.
- Hughes, P. and Heritage, J. 2004. *Antibiotic growth-promoters in food animals. In assessing quality and safety of animal feeds* (pp. 129-151). Rome, Italy: FAO.

- Humphrey, B. D., Klasing, K.C., 2003. *Modulation of nutrient metabolism and homeostasis by the immune system*. In: Proceedings of the European Symposium on Poultry Nutrition, Lillehammer, Norway.
- Islam S. 2013. Clinical evaluation of hyperimmune serum for the treatment of newcastle disease in indigenous layer birds. Thesis. Dacca, Bangladesh. Bangladesh Agricultural University.
- Ivec, M., Botic, T., Koren, S., Jakobsen, M., Weingartl, H. and Cencic, A. Interactions of macrophages with probiotic bacteria lead to increased antiviral response against vesicular stomatitis virus. *Antiviral Res.*, 75: 266-274.
- Iwasaki, A. and Medzhitov, R. 2004. Toll-like receptor control of the adaptive immune responses. *Nat. Immunol.*, 5: 987-995.
- Izumo, T., Maekawa, T., Ida, M., Noguchi, A., Kitagawa, Y., Shibata, H., Yasui, H. and Kiso, Y. 2010. Effect of intranasal administration of *Lactobacillus pentosus* S-PT84 on influenza virus infection in mice. *Int. Immunopharmacol.*, 10: 1101-1106.
- Jadhav, K., Sharma, K.S., Katoch, S., Sharma, V.K. and Mane, B.G. 2015. Probiotics in Broiler Poultry Feeds: A Review. *J. Anim. Nut. and Phy.* 1: 04-16.
- James, R.G. 2004. *Modern livestock and Poultry Production*. 7<sup>th</sup> Edition. Thomson Delmar Learning Inc., FFA Activities, London.
- Jasim, M.S. and Fehan, A.A. 2017. Application of Probiotic with Different levels of Citric Acid Supplementation in the Diet for Promotes the Production Efficiency of Broiler Chickens. *J. Agri. Vet. Sci.*, 10(9): 50-57.
- Jiang, H., Yang, H. and Kapczynski, D.R. 2011. Chicken interferon alpha pretreatment reduces virus replication of pandemic H1N1 and H5N9 avian influenza viruses in lung cell cultures from different avian species. *Virology Journal*. 8:447.
- Jin, L.Z., Ho, Y.W., Abdullah, N. and Jalaludin, S. 2000. Digestive and Bacterial Enzyme Activities in Broilers Fed Diets Supplemented with *Lactobacillus* Cultures. *Poult. Sci.*, 79: 886-891.
- Juven, B.J. and Stern, N.J. 1991. A review: Antagonistic effects of *Lactobacilli* and *Pedococci* to control intestinal colonization by human enteropathogens in live poultry. *J. App. Bacteriol.* 70: 95-103.

- Kabir, S.M.L., Rahman, M.M., Rahman, M.B., Rahman, M.M. and Ahmed, S.U. 2004. The Dynamics of Probiotics on Growth Performance and Immune Response in Broilers. *Int. J. Poult. Sci.*, 3: 361-364.
- Kafi, A., Uddin, M.N., Uddin, M.J., Khan, M.M.H. and Haque, M.E. 2017. Effect of Dietary Supplementation of Turmeric (*Curcuma longa*), Ginger (*Zingiber officinale*) and their Combination as Feed Additives on Feed Intake, Growth Performance and Economics of Broiler. *Int. J. Poult. Sci.* 16(7): 257-265.
- Kahn, C.M. 2005. *The Merck Veterinary Manual*. 9th edn. Philadelphia: National Publishing Inc.
- Kapczynski, D.R., Afonso, C.L. and Miller, P.J. 2013. Immune responses of poultry to Newcastle disease virus. *Dev. Compar. Immun.*, 41: 447-453.
- Kartasudjana, R. dan Suprijatna, E. 2006. *Manajemen Ternak Unggas*. Penebar Swadya. Jakarta.
- Kasimoglu-Dogru, A., Y.E. Gencay and N.D. Ayaz. 2010. Prevalence and antibiotic resistance profiles of Enterococcus species in chicken at slaughter level; absence of vanA and vanB genes in *E. faecalis* and *E. faecium*. *Res. Vet. Sci.* 89:153-158.
- Kencana, G.A.Y., Suartha, I.N., Paramita, N.M.A.S. dan Handayani, A.N. 2016. Vaksin Kombinasi Newcastle Disease dengan Avian Influenza Memacu Imunitas Protektif pada Ayam Petelur terhadap Penyakit Tetelo dan Flu Burung. *J. Vet.* 17 ( 2): 257-264.
- Khatun, M., Islam, K.M.S., Howleder, M.A.R., Haque, M.N., Chowdhury, R. and Karim, M.R. 2010. Effects of dietary citric acid, probiotic and their combination on the performance, tibia ash and non-specific immune status of broiler. *Indian J. Anim. Sci.*, 80(8): 813-816.
- Khosravi, A., Boldaji, F. and Dastar, B. 2010. Immune response and performance of broiler chicks fed protexin na propionic acid. *Int. J. Poult. Sci.*, 9: 188-191.
- Koenen, M.E., Karmar, J., van der Hulst, R., Heres, L., Jeurissen, S.H. and Boersma, W.J. 2004. Immunomodulation by probiotic lactobacilli in layer and meat-type chickens. *Br. Poult. Sci.* 45: 355-366.
- Kopecký, J., Hrnčár, C. and Weis, J. 2012. Effect of Organic Acids Supplement on Performance of Broiler Chickens. *Anim. Sci. Biotech.*, 45(1).

- Koščová, J., Nemcová, R., Gancarèiková, S., Jonecová, Z., Sciranková, L., Bomba, A. and Buleca, V. 2006. Effect of two plant extracts and *Lactobacillus fermentum* on colonization of gastrointestinal tract by *Salmonella enterica* var. Düsseldorf in chicks. *Boilogia*, 61(6): 775-778.
- Kowalczyk, K., Daiss, J., Halpern, J. and Roth, T.F. 1985. Quantitation of maternal–fetal IgG transport in the chicken. *Immunology*. 54: 755-762.
- Kramer, T.T. dan Cho, H.C. 1970. Transfer of immunoglobulins and antibodies in the hens egg. *Immunology*. 19: 157-167.
- Krishnamurthy, S. and Samal, S.K. 1998. Nucleotide sequences of the trailer, nucleocapsid protein gene and intergenic regions of Newcastle disease virus strain Beaudette C and completion of the entire genom sequence. *J. Gen. Virol.* 79: 2419 – 2424.
- Kusumaningrum W. 2008. Efektifitas Kunyit, Bawang Putih, dan Zink dalam Pakan Terhadap Aktivitas dan Kapasitas Fagositosis Sel Polimorfonuklear. Ayam Broiler. Skripsi: Fakultas Kedokteran Hewan, Institut Pertanian Bogor.
- Lamb, R.A., P.L. Collins, D. Kolakofsky, J.A. Melero, Y. Nagai, M.B.A. Oldstone, C.R. Pringle and B.K. Rima. 2005. *Family paramyxoviridae*. In: *Virus taxonomy: The Classification and Nomenclature of viruses*. Fauquet, C.M. (Ed.). The Eighth Report of the International Committee on Taxonomy of Viruses. Elsevier Academic Press, San Diego, CA. pp. 655 – 668.
- Lange, D.L. and Brokking, D.H. 2005. Nutribiotics could replace antibiotics in feed. *World Poultry*. 10(21):26-28.
- Leena, C., Prasad, R.V., Kakade, K. and Jamuna, K.V. 2012. Age related changes in the histology of the bursa of the domestic fowl (*Gallus domesticus*). *J. Vet. Anim. Sci.* 43: 45-48.
- Leslie, G.A. and Clem, W.L. 1969. Phylogeny of immunoglobulin structure and function. 3. Immunoglobulins of the chicken. *J. Exp. Med.*, 130: 1337-1352.
- Letran, S.E., Lee, S.J., Atif, S.M., Uematsu, S., Akira, S. and McSorley, S.J. 2011. TLR5 functions as an endocytic receptor to enhance flagellin-specific adaptive immunity. *Eur. J. Immunol.* 41: 29-38.

- Li, L.L., Hou, Z.P., Li, T.J., Wu, G.Y., Huang, R.L., Tang, Z.R., Yang, C.B., Gong, J., Yu, H. and Kong, X.F., 2008. Effects of dietary probiotic supplementation on ileal digestibility of nutrients and growth performance in 1- to 42-day-old broilers. *J. Sci. Food Agric.* 88: 35–42.
- Li, S.P., Zhao, X.J. and Wang, J.Y. 2009. Synergy of Astragalus polysaccharides and probiotics (*Lactobacillus* and *Bacillus cereus*) on immunity and intestinal microbiota in chicks. *Poult. Sci.*, 88: 519-525.
- Li, Z., Wang, W., Liu, D. and Guo, Y. 2018. Effects of *Lactobacillus acidophilus* on the growth performance and intestinal health of broilers challenged with *Clostridium perfringens*. *J. Anim. Sci. Biotech.*, 9:25.
- Lim, H.S., Namkung, H., Um, J.S., Kang, K.R., Kim, B.S. and Paik, I.K. 2001. The Effects of Phytase Supplementation on The Performance of Broiler Chickens Fed Diets with Different Levels of Non-Phytase Phosphorus. *Asian-Aust. J. Anim. Sci.* 14(2): 250-257.
- Lin, J., Hunkapiller, A.A., Layton, A.C., Chang, Y.J. and Robbins, K.R. 2013. Response of intestinal microbiota to antibiotic growth promoters in chickens. *Foodb. Pathog. Dis.*, 10:331-7.
- Liu, K., Victora, G.D., Schwickert, T.A., Guermontprez, P., Meredith, M.M., Yao, K., Chu, F.F., Randolph, G.J., Rudensky, A.Y. and Nussenzweig, M. 2009. *In vivo* analysis of dendritic cell development and homeostasis. *Science.* 324: 392-397.
- Loeken, M.R. and Roth, T.F. 1983. Analysis of maternal IgG subpopulations which are transported into the chicken oocyte. *Immunology.* 49: 21-28.
- Mahima, R.A., Deb, R., Latheef, S.K., Abdul, S.H., Tiwari, R., Verma, A.K., Kumar, A., Dhama, K. 2012. Immunomodulatory and therapeutic potentials of herbal, traditional/indigenous and ethnoveterinary medicines. *Pak. J. Biol. Sci.* 15: 754–774.
- Mahendra, B. 2005. *Jenis Tanaman Obat Ampuh*. Cetakan 1. Penebar Swadaya, Jakarta.
- Malayoğlu, H.B., Baysal, Ş., Misirlioğlu, Z., Polat, M., Yilmaz, H. and Turan, N. 2010. Effects of oregano essential oil with or without feed enzymes on growth performance, digestive enzyme, nutrient digestibility, lipid metabolism and immune response of broilers fed on wheat–soybean meal diets. *Brit. Poult. Sci.*, 51(1): 67-80.
- Marangon, S. and Busani, L. 2006. The use of vaccination in poultry production. *Rev. Sci. Tech. Off. Int. Epiz.* 26: 265-274.

- Marcus, P.I., van der, H.L. and Sekellick, M.J. 1999. Interferon action on avian viruses. I. Oral administration of chicken interferon-alpha ameliorates Newcastle disease. *J. Interferon Cytokine Res.*, 19: 881-885.
- Mastika, I.M. 2000. *Ilmu Nutrisi Unggas*. Penerbit Universitas Udayana, Denpasar.
- Masum, M.A., Khan, M.Z.I., Nasrin, M., Siddiqi, M.N.H., Khan, M.Z.I., Islam, M.N. 2014. Detection of immunoglobulins containing plasma cells in the thymus, bursa of fabricius and spleen of vaccinated broiler chickens with Newcastle disease virus vaccine. *Int. J. Vet. Sci. Med.* 2: 103-108.
- May, J.D. and Lott, B.D. 2001. Relating Weight Gain and Feed: Gain of Male and Female Broilers to Rearing Temperature. *Poult. Sci.*, 80: 581-584.
- Medici, M., Vinderola, C.G., Weill, R. & Perdigo'n, G. 2005. Effect of fermented milk containing probiotic bacteria in the prevention of an enteroinvasive *Escherichia coli* infection in mice. *Journal of Dairy Research*, 72: 243-249.
- Merchant, I.A. and Packer, R.A. 1961. *Veterinary Bacteriology and Virology*. The IOWA State Collage Press, Ames, Iowa.
- Midilli, M, Alp, M., Kocabağlı, N., Muğlalı, Ö.H., Turan, N., Yılmaz, H. and Çakır, S. 2008. Effects of dietary probiotic and prebiotic supplementation on growth performance and serum IgG concentration of broilers. *South African J. Ani. Sci.* 21-27.
- Miles, R.D., Butcher, G.D., Henry, P.R. and Littell, R.C. 2006. Effect of Antibiotic Growth Promoters on Broiler Performance, Intestinal Growth Parameters, and Quantitative Morphology. *Poult. Sci.*, 85:476-485.
- Miller, P.J., Estevez, C., Yu, Q., Suarez, D.L. and King, D.J. 2009. Comparison of viral shedding following vaccination with inactivated and live Newcastle disease vaccines formulated with wild-type and recombinant viruses. *Av. Dis.* 53: 39-49.
- Mookiah, S., Sieo, C. C., Ramasamy, K., Abdullah, N. and Ho, Y. W. 2014. Effects of dietary prebiotics, probiotic and synbiotics on performance, caecal bacterial populations and caecal fermentation concentrations of broiler chickens. *Journal of the Science of Food and Agriculture*, 94(2): 341348.

- Moon, J.J., Chu, H.H., Pepper, M., McSorley, S.J., Jameson, S.C., Kedl, R.M. and Jenkins, M.K. 2007. Naive CD<sup>4+</sup> T cell frequency varies for different epitopes and predicts repertoire diversity and response magnitude. *Immunity*. 27: 203-213.
- Morrison, T.G. 2003. Structure and function of a paramyxovirus fusion protein. *Biochem. Biophys. Acta*, 1614: 73 – 84.
- Mountzouris, K., Tsitsirikos, P., Palamidi, I., Arvaniti, A., Mohnl, M., Schatzmayr, G. & Fegeros, K. 2010. Effects of probiotic inclusion levels in broiler nutrition on growth performance, nutrient digestibility, plasma immunoglobulins, and cecal microflora composition. *Poultry Science*, 89(1): 58–67.
- Murarolli, V.D.A., Burbarelli, M.F.C., Polycarpo, G.V., Ribeiro, P.A.P., Moro, M.E.G. and Albuquerque, R. 2014. Prebiotic, Probiotic and Symbiotic as Alternative to Antibiotics on the Performance and Immune Response of Broiler Chickens. *Brazilian Journal of Poultry Science*. 16(3): 279-284.
- Murtidjo, B. A., 1992. *Pedoman Beternak Ayam Broiler*. Kanisius. Yogyakarta.
- Mutia, R. and Sumiati. Supplementation *Curcuma longa* Or *Curcuma xanthorrhiza* on Broiler Performance. Proceeding The 2nd International Seminar "Feed Safety for Healty Food": 3-9.
- Nagai, Y., H. D. Klenk, and R. Rott. 1976. Proteolytic cleavage of the viral glycoproteins and its significance for the virulence of Newcastle disease virus. *Virology* 72:494–508.
- Naseri, K.G., Rahimi, S. and Khaki, P. 2012. Comparison of the effects of probiotic, organic acid and medicinal plant on *Campylobacter jejuni* challenged broiler chickens. *J. Agric. Sci. Technol*. 14:1485–1496.
- Nasrin, M., Siddiqi, M.N.H., Masum, M.A. and Wares, M.A. 2012. Gross and histological studies of digestive tract of broilers during postnatal growth and development. *J. Bangladesh Agril. Univ.*, 10(1): 69-77.
- National Research Council. 1994. *Nutrient Requirements of Poultry*. 9<sup>th</sup> Resived Edition. National Academic Press, Washington, DC.
- Ndelekwute, E.K., Enyenihi, G.E., Unah, U.L. and Madu, H.C. 2016. Dietary effects of different organic acids on growth and nutrient digestibility of broiler. *Bang. J. Anim. Sci*. 45(2): 10-17.

- Ng, S.C., Hart, A.L., Kamm, M.A., Stagg, A.J. and Knight, S.C. 2009. Mechanisms of action of probiotics: recent advances. *Inflammatory Bowel Diseases*, 15: 300-310.
- Niewold, T.A. 2007. The nonantibiotic anti-inflammatory effect of antimicrobial growth promoters, the real mode of action, A hypothesis. *World Poultry Science Journal*. 86: 605-609.
- Nikpiran, H., Taghavi, M., Khodadadi, A. and Athari, S.S. 2013. Influence of Probiotic and Prebiotic on broiler chickens performance and immune status. *Journal of Novel Applied Sciences*. 2(8):256-259.
- NRC (National Research Council). 1994. *Nutrient Requirements of Poultry*. Ed Rev ke-9. Washington DC: Academy Pr.
- Nursal, W.S. dan Juwita W.S. 2006. Bioaktivitas ekstrak Jahe (*Zingiber officinale* Roxb) dalam menghambat pertumbuhan koloni bakteri *Escherichia coli* dan *Bacillus subtilis*. *J. Biogen*. 2(2): 64-66.
- OIE. 2008. Chapter 2.3.14 In: *Manual of diagnostic tests and vaccines for terrestrial animals*, 6th ed., Paris, France. pp. 576-589.
- OIE, 2012. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*. Chapter 2. 3. 14. Newcastle Disease.
- Oláh I, Vervelde L. 2008. *Structure of the avian lymphoid system*. In: Davison F, Kaspers B, Schat KA, editors. *Avian Immunol*. California (US): Academic Press is an imprint of Elsevier. p. 13-50.
- Omar, J.A., Hejazi, A. and Badran, R. 2016. Performance of Broilers Supplemented with Natural Herb Extract. *J. Anim. Sci.*, 6: 68-74.
- Onu, P.N. 2010. Evaluation of Two Herbal Spices as Feed Additives for Finisher Broilers. *Biotech. Anim. Husbandry*. 26(5-6): 383-392.
- Panda, A.K., Reddy, M.R., Ramarao, S.V., Raju, M.V.L.N. & Praharaj, N.K. 2000. Growth, carcass characteristics, immunocompetence and response to *Escherichia coli* of broilers fed diets with various levels of probiotic. *Archiv für Geflügelkunde*, 64: 152-156.
- Paradis, M.A., McMillan, E., Bagg, R., Vessie, G., Zocche, A. and Thompson, M. 2016. Efficacy of avilamycin for the prevention of necrotic enteritis caused by a pathogenic strain of *Clostridium perfringens* in broiler chickens. *Av. Pathol.*, 45(3): 365-369.

- Pascual, M., Hugas, M., Badiola, J.I., Monfort, J.M. & Garriga, M. 1999. *Lactobacillus salivarius* CTC2197 prevents *Salmonella enteritidis* colonization in chickens. *Applied Environmental Microbiology*, 65: 4981-4986.
- Patterson, J.A., Burkholder, K.M., 2003. Application of probiotics and probiotics in poultry production. *Journal of Poultry Science*. 82: 627-631.
- Pedersen, J.C. 2008. Hemagglutination-inhibition test for avian influenza virus subtype identification and the detection and quantitation of serum antibodies to the avian influenza virus. *Methods. Mol. Biol.*, 436: 53-66.
- Pedroso, A.A., Hurley-Bacon, A.L., Zedek, A.S., Kwan, T.W., Jordan, A.P.O., Avellaneda, G., Hofacre, C.L., Oakley, B.B., Collett, S.R., Maurer, J.J. & Lee, M.D. 2013. Can probiotics improve the environmental microbiome and resistome of commercial poultry production? *International Journal of Environmental Research and Public Health*, 10(10): 4534–4559.
- Perdigón, G., Alvarez, S., Nader de Macias, M.E. & Pesce de Ruiz Holgado, A.A. 1988. Adjuvant activity of lactic bacteria: perspectives for its use in oral vaccines. *Revista Argentina de microbiologia*, 20: 141-146.
- Permentan. 2017. Peraturan Menteri Pertanian Republik Indonesia Nomor 14/PERMENTAN/PK.350/5/2017 tentang Klasifikasi Obat Hewan.
- Pio, P.O., Ardana, I.B.K. dan Suastika, P. 2017. Efektivitas Berbagai Dosis Asam Organik dan Anorganik Sebagai *Acidifier* Terhadap Histomorfometri Duodenum Ayam Pedaging. *Ind. Med. Vet.* 6(1): 47-54.
- Prakasita, V.C., Asmara, W., Widyarini, S., Wahyuni, A.E.T.H. 2019. Combination of herbs and probiotics as an alternative growth promoter: An in vitro study. *Vet. World*. 12(4): 614-620.
- Qorbanpour, M., Fahim, T., Javandel, F., Nosrati, M. Paz, E., Seidavi, A., Ragni, M., Laudadio, V. and Tufarelli, V. 2018. Effect of Dietary Ginger (*Zingiber officinale* Roscoe) and Multi-Strain Probiotic on Growth and Carcass Traits, Blood Biochemistry, Immune Responses and Intestinal Microflora in Broiler Chickens. *Animals*, 8: 117.
- Rahman, M., Mustari, A., Salauddin, M. and Rahman, M. 2013. Effects of probiotics and enzymes on growth performance and haematobiochemical parameters in broilers. *Journal of the Bangladesh Agricultural University*, 11(1): 111–118.

- Ramesh, B.K., Satynarayana, M.L., Gowda, R.N.S., Vijayasarithi, S.K. and Suguna, R. 2000. Effect of *Lactobacillus acidophilus* on Gut pH and Viable Bacterial Count in Experimental Fowl Typhoid in Broilers. *Indian Veterinary Journal*, 77(6): 544-546.
- Rasyaf, M. 2008. *Beternak Ayam Pedaging*. Penebar Swadaya. Jakarta.
- Reed, L.J. and Muench, H. 1938. A simple method of estimating fifty percent endpoints. *Am. J. Hyg.* 27: 493-497.
- Robinson, P.K. 2015. Enzymes: principles and biotechnological applications. *Essays Biochem.*, 59: 1-41.
- Rodjan, P., Soisuwan, K., Thongprajukaew, K., Theapparatt, Y., Khongthong, S., Jeenkeawpieam, J. and Salaeharar, T. 2017. Effect of organic acids or probiotics alone or in combination on growth performance, nutrient digestibility, enzyme activities, intestinal morphology and gut microflora in broiler chickens. *J. Anim. Physiol. Anim. Nutr.* 102(2): 931-940.
- Rodríguez-Lecompte, J.C., Yitbarek, A., Brady, J., Sharif, S., Cavanagh, M.D., Crow, G., Guenter, W., House, J.D. and Camelo-Jaimes, G. 2012. The effect of microbialnutrient interaction on the immune system of young chicks after early probiotic and organic acid administration. *J. Anim. Sci.* 90: 2246–2254.
- Rose, M.E., Orlans, E. and Buttress, N. 1974. Immunoglobulin classes in the hen's egg: Their segregation in yolk and white. *Eur. J. Immunol.*, 4: 521-523.
- Rott, R. and H. D. Klenk. 1988. *Molecular basis of infectivity and pathogenicity of Newcastle disease virus*. In D. J. Alexander (ed.). *Newcastle Disease*. Kluwer Academic Publishers: Boston, MA, 98–112.
- Rukmana, R. 2005. *Temu Hitam*. Kanisius. Yogyakarta.
- Sabiha, M.K.A., Elizabeth, V.K. and Jalaludeen, A. 2005. Effect of Supplementation of Probiotic on the Growth Performance of Broiler Chicken. *Indian Journal of poultry Science*, 40(1): 73-75.
- Sadeghi, G.H., Karimi, A., Padidar Jahromi, S.H., Azizi, T. and Daneshmand, A. 2012. Effects of Cinnamon, Thyme and Turmeric Infusions on the Performance and Immune Response in of 1-to 21-Day-Old Male Broilers. *Brazil. J. Poult. Sci.*, 14(1): 15-20.

- Salehimanesh, A., Mohammadi, M. and Roostaei-Ali Mehr, M. 2015. Effect of Dietary Probiotic, Prebiotic and Symbiotic Supplementation on Performance, Immune Responses, Intestinal Morphology and Bacterial Populations in Broilers. *Journal of Animal Physiology and Animal Nutrition*. 100(4): 694-700.
- Salam, S., Fatahilah, A., Sunarti, D. dan Isroli. 2013. Berat Karkas dan Lemak Abdominal Ayam Broiler yang diberi Tepung Jintan Hitam (*Nigella sativa*) dalam Ransum selama Musim Panas. *Sains Peternakan*. 11(2): 84-90.
- Salminen, S., von Wright, A., Morelli, L., Marteau, P., Brassart, D., de Vos, W. M. 1998. Demonstration of safety of probiotics – A review. *International Journal of Food Microbiology*, 44: 93–106.
- Samadi, B. 2010. *Sukses Beternak Ayam Ras Petelur dan Pedaging*. Pustaka Mina. Jakarta.
- Samal, S.K. 2011. *Newcastle Disease and Related Avian Paramyxoviruses*. Caister Academic Press, U.K.
- Samli, H.E., Senkoğlu, N., Koc, F., Kanter, M. and Ağma, A. 2007. Effects of *Enterococcus faecium* and dried whey on broiler performance, gut histomorphology and microbiota. *Arch. Anim. Nutr.* 61: 42–49.
- Sande, A.S., Kapusnik-Uner, J.E. dan Mandell, G.L. 1990. *Antimicrobial Agents, General Considerations*. Dalam : Gilman AG, Rall TW, Nies, A.S. dan Taylor, P. (Eds), *Goodman and Gilman's The Pharmacological Basis of Therapeutics*, 8<sup>th</sup> ed., Pergamon Press, 1018-1046.
- Santhakumar, D., Rubbenstroth, D., Martinez-Sobrido, L., Munir, M. 2017. Avian Interferons and Their Antiviral Effectors. *Front. Immunol.*, 8:49.
- Sarcheshmei, M., Dadras, H., Mosleh, N. and Mehrabanpour, M.J. 2016. Comparative Evaluation of The Protective Efficacy of Different Vaccination Programs Against a Virulent Field Strain of the Newcastle Disease Virus in Broilers. *Brazilian Journal of Poultry Science*. 18(3): 363-370.
- Sawant, P.M., Verma, P.C., Subudhi, P.K., Chaturvedi, U., Singh, M., Kumarc, R. and Tiwaric, 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.

- Shabani, R., Nosrati, M., Javandel, F. and Kioumars, H. 2012. The Effect of Probiotics on Carcass and Internal Organs of Broilers. *Annals of Biological Research*. 3 (12): 5475-5477.
- Shoeib, H.K., Sayed, A.N., Sotohy, S.A. and Ghaffar, A.S.K. 1997. Response of broiler chicks to probiotic (pronifer) supplementation. *Ass. Vet. Med. J.*, 36: 103-116.
- Simbaya, J., Slominski, B.A., Guenter, W., Morgan, A. and Cambell, L.D. 1996. The Effects of Protease and carbohydrase on The Nutritive Value of Canola Meal for Poultry : In Vitro and In Vivo Studies. *Anim. Feed. Sci. Technol.* 61: 219-234.
- Smulikowska, J., Czerwiński, J., Mieczkowska, A. 2010. Effect of an organic acid blend and phytase added to a rapeseed cake-containing diet on performance, intestinal morphology, caecal microflora activity and thyroid status of broiler chickens. *J. Anim. Phy. Anim. Nutr.*, 94: 15-23.
- Sohail, M.U., Ijaz, A., Yousaf, M.S., Ashraf, K., Zaneb, H., Aleem, M. and Rehman, H. 2010. Alleviation of cyclic heat stress in broilers by dietary supplementation of mannan-oligosaccharide and Lactobacillus-based probiotic: dynamics of cortisol, thyroid hormones, cholesterol, C-reactive protein, and humoral immunity. *Poult. Sci.* 89: 1934-1938.
- Suprijatna, E., Atmomarsono, U. dan Kartasudjana, R. 2005. *Ilmu Dasar Ternak Unggas*. Penebar Swadaya, Jakarta.
- Swayne, D.E., Glisson, J.R., Pearson, J.E., Reed, W.M., Jackwood, M.W. and Woolcock, P.R. 2008. *A Laboratory Manual For The Isolation, Identification and Characterization of Avian Pathogens*. 5<sup>th</sup> edition. American Association of Avian Pathologists, Athens, GA.
- Tabbu., C.R. 2000. *Penyakit Ayam dan Penanggulangannya*, Volume 1. Kanisius. Yogyakarta.
- Taghdisi, A. and Hejazi, S. 2018. The Effect of Zingiber officinale on the Spleen Tissue and Antibody Titer of Broiler Chickens. *J. Morphol. Sci.*
- Takeda, S., Takeshita, M., Kikuchi, Y., Dashnyam, B., Kawahara, S., Yoshida, H., Watanabe, W., Muguruma, M. and Kurokawa, M. 2011. Efficacy of oral administration of heat-killed probiotics from Mongolian dairy products against influenza infection in mice: Alleviation of influenza infection by its immunomodulatory activity through intestinal immunity. *Int. Immunopharmacol.*, 11: 1976-1983.

- Talebi, A., Amirzadeh, B., Mokhtari, B. and Gahri, H. 2008. Effects of a multistrain probiotic (PrimaLac) on performance and antibody responses to Newcastle disease virus and infectious bursal disease virus vaccination in broiler chickens, *Avian Pathol.*, 37:5, 509-512.
- Tang, A.L., Shah, N.P., Wilcox, G., Walker, K.Z. and Stojanovska, L. 2007. Fermentation of Calcium Fortified Soya Milk with *Lactobacillus*: Effects on Calcium Solubility, Isoflavone Conversion and Production of Organic Acids. *Journal of Food Science*, 72: 431-436.
- Tanzin, M., Islam, K.M.S., Debi, M.R. and Islam, M.R. 2015. Effect of citric acid, herbal feed additive and their combination on the performance of broiler. *Bang. J. Anim. Sci.* 44(3): 143-150.
- Taylor, R.L dan McCorkle, F.M. 2009. A landmark contribution to poultry science immunological function of the bursa of Fabricius. *Poult. Sci.*, 88: 816-823.
- Teo, A.Y. and Tan, H.M. 2007. Evaluation of the performance and intestinal gut microflora of broilers fed on corn-soy diets supplemented with *Bacillus subtilis* PB6 (Clo-STAT). *J. Appl. Poult. Res.* 16: 296-303.
- Thompson, A., Van Moorlehem, E. and Aich, P. 2010. Probiotic-induced priming of innate immunity to protect against rotaviral infection. *Probiotics Antimicrob Proteins.* 2: 90-97.
- Tillman, A.D., Hartadi, H., Reksohadiprodjo, S., Prawirokusumo, S. dan Lehdosoekojo, S. 1991. *Ilmu Makanan Ternak Dasar*. Universitas Gadjah Mada Press, Yogyakarta.
- Tizard, I.R. 2000. *Vaccinations and vaccines. In: Veterinary immunology an introduction.* 6th ed. Philadelphia (US): WB Saunders Company. p. 239-241.
- Umar, M.I., Asmawi, M.Z.B., Sadikun, A., Altaf, R. and Iqbal, M.A. 2011. Phytochemistry and medicinal properties of *Kaempferia galanga* L. (Zingiberaceae) extracts. *Af. J. of Pharm. and Pharmaco.* 5(14): 1638-1647.
- Wagner, R.D., Dohnake, M., Hilty, M., Vazquez-Torres, A. & Balish, E. 2000. Effects of probiotic bacteria on humoral immunity to *Candida albicans* in immunodeficient *bg/bg-nu/nu* and *bg/bg-nu+* mice. *Revista Iberoamericana de Micologia*, 17: 55-59.

- Wang, Y. and Gu, Q. 2010. Effect of probiotic on growth performance and digestive enzyme activity of Arbor Acres broilers. *Res. Vet. Sci.*, 89: 163-167.
- Wegener, H.C., Aarestrup, F.M., Jensen, L.B., Hammerum, A.M. and Bager, F. 1999. Use of Antimicrobial Growth Promoters in Food Animals and Enterococcus faecium Resistance to Therapeutic Antimicrobial Drugs in Europe. *Emerg. Infec. Dis.*, 5(3): 1080-6059.
- Wegener, H.C. 2003. Antibiotics in animal feed and their role in resistance development, *Curr. Opin. Microbiol.* 6: 439-445.
- Van Boven, M., Bouma, A., Fabri, T.H.F., Katsma, E., Hartog, L. and Koch, G. 2008. Herd immunity to Newcastle disease virus in poultry by vaccination. *Avian Pathol.* 37: 1-5.
- Velasco, S., Ortiz, L.T., Alzueta, C., Rebole, A., Trevio, J., Rodriguez, M.L., 2010. Effect of inulin supplementation and dietary fat source on performance, blood serum metabolites, liver lipids, abdominal fat deposition, and tissue fatty acid composition in broiler chickens. *Poult. Sci.* 89: 1651-1662.
- Wealleans, A.L., Walsh, M.C., Romero, L.F. and Ravindran, V. 2011. Comparative effects of two multi-enzyme combinations and a Bacillus probiotic on growth performance, digestibility of energy and nutrients, disappearance of non-starch polysaccharides, and gut microflora in broiler chickens. *Poult. Sci.*, 96: 4287-4297.
- White, D.G., Ayers, S., Maurer, J.J., Thayer, S.G. and Hofacre, C. 2003. Antimicrobial susceptibilities of *Staphylococcus aureus* isolated from commercial broilers in Northeastern Georgia. *Avian Dis.* 47: 203-210.
- Wibowo, S.E., Asmara, W., Wibowo, M.H. dan Sutrisno, B. 2013. Perbandingan Tingkat Proteksi Program Vaksinasi Newcastle Disease pada Broiler. *Jurnal Sain Veteriner.* 31(1): 0126-0421.
- Williams, J.E. and Dillard, L.H. 1968. Penetration patterns of Mycoplasma gallisepticum and Newcastle disease virus through the outer structures of chicken eggs. *Avian Dis.* 12: 650-657.
- Wolfenden, A.D., Vicente, J.L., Higgins, J.P., Andreatti Filho, R.L., Higgins, S.E., Hargis, B.M. and Tellez, G. 2007. Effect of Organic Acids and Probiotics on *Salmonella enteritidis* Infection in Broiler Chickens. *Int. J. Poult. Sci.*, 6: 403-405.

- Xuan, Z.N., Kim, J.D., Lee, J.H., Han, Y.K., Park, K.M. and Han, I.K. 2001. Effects of Enzyme Complexes on Growth Performance and Nutrient Digestibility in Pigs Weaned at 14 days of Age. *Asian-Aust. J. Anim. Sci.* 14(2): 231-236.
- Yadav, M., Dubey, M., Yadav, M. and Shankar, K.S. 2018. Effect of Supplementation of Probiotic (*Bacillus subtilis*) on Growth Performance and Carcass Traits of Broiler Chickens. *Int. J. Curr. Microbiol. App. Sci.*, 7(8): 4840-4849.
- Yang, C.M., Cao, G.T., Ferket, P.R., Liu, T.T., Zhou, L., Zhang, L., Xiao, Y.P. and Chen, A.G. 2012. Effects of Probiotic, *Clostridium butyricum*, on Growth Performance, Immune Function, and Cecal Microflora in Broiler Chickens. *Poultry Science*. 91: 2121–2129.
- Yazhini, P., Visha, P., Selvaraj, P., Vasanthakumar, P., Chandran, V. 2018. Dietary encapsulated probiotic effect on broiler serum biochemical parameters. *Vet. World*. 11(9): 1344-1348.
- Yusoff, K. and Tan, W.S. 2001. Newcastle Disease Virus: Macromolecules and Opportunities. *Avian Pathology*. 30: 439-455.
- Zakaria, F.R. dan Rajab, T.M. 1999. Pengaruh ekstrak jahe (*Zingiber officinale* Roscoe) terhadap produksi radikal bebas makrofag mencit sebagai indikator imunostimulan secara in vitro. Persatuan Ahli Pangan Indonesia (PATPI). Prosiding Seminar Nasional Teknologi Pangan: 707-716.
- Zaki, M.M., El-Ghany, W.A.A., Hady, M.M. and Korany, R.M.S. 2016. Effect of Certain Phytochemicals on the Immune Response of Newcastle Disease Vaccinated Broiler Chickens. *Asian J. Poult. Sci.*, 10: 134-140.
- Zhang, G.F., Yang, Z.B., Wang, Y., Yang, W.R., Jiang, S.Z. and Gai, G.S. 2009. Effects of ginger root (*Zingiber officinale*) processed to different particle sizes on growth performance, antioxidant status, and serum metabolites of broiler chickens. *Poult. Sci.* 88 :2159-2166.
- Zhou, H., Gong, J., Brisbin, J.T., Yu, H., Sanei, B. and Sabour, P. 2007. Appropriate chicken sample size for identifying the composition of broiler intestinal microbiota affected by dietary antibiotics, using the polymerase chain reaction-denaturing gradient gel electrophoresis technique. *Poult. Sci.*, 86: 2541-9.