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DAFTAR PUSTAKA

Aberle, E. D., J. C. Forrest, D. E. Gerrard, E. W. Mills, H. B. Hendrick, M. D. Judge, dan R. A. Merkel. 2001. Principle of Meat Science. 4th edition. Kendal Hunt Publishing Company. Iowa.

Adams, C. A. 2000. The role of nutricines in health and total nutrition. Pages 17-24 in Proc. Australian Poultry Science Symposium. The University of Sydney. Sydney.

Adeyanju, G. T. dan O. Ishola. 2014. *Salmonella* and *Escherichia coli* contamination of poultry meat from a processing plant and retail markets in Ibadan, Oyo State, Nigeria. Springerplus. 3: 1-9.

Adil, S., T. Banday, G. A. Bhat, M. S. Mir, dan M. Rehman. 2010. Effect of dietary supplementation of organic acids on performance, intestinal histomorphology, and serum biochemistry of broiler chicken. J. Vet. Med. Int. 7: 479-485

Adil, S. dan S. N. Magray. 2012. Impact and manipulations of gut microflora in poultry: A review. J. Anim. Vet. Adv. 11: 873-877.

Adriani, L., R. A. Ana, Y. An-An, M. Andi, dan I. Nenden. 2014. Profil serum glutamate oxaloacetat transaminase (SGOT) and glutamate pyruvate transaminase (SGPT) level of broiler that was given noni juice (*Morinda citrifolia*) and palm sugar (*Arenga piata*). Seria Zootehnie. 62: 101-105.

Ahmed, M. F., M. A. Ahmed, H. Thayyil, K. Zameeruddin, dan M. Ibrahim. 2008. Antioxidative activity of *Melia azedarach* Linn leaf extract. Iran. J. Pharm. Ther. 7: 31-34.

Ahmed, M. F., A. S. Rao, S. R. Ahemad, dan M. Ibrahim. 2012. Phytochemical studies and antioxidant activity of *Melia azedarach* Linn leaves by DPPH scavenging assay. Int. J. Pharm. Appl. 3: 271-276.

Allen, P. C., J. Lydon, dan H. Danforth. 1997. Effects of components of *Artemisia annua* on coccidia infections in chickens. Poult. Sci. 76: 1156-1163.

Alves, A. C. S., R. M. Mainardes, dan N. M. Khalil. 2016. Nanoencapsulation of gallic acid and evaluation of its cytotoxicity and antioxidant activity. Mater. Sci. Eng. 60: 126-134.

Al-Dhanki, Z. T. M., A. F. M. Al-Enzy, dan A. B. Y. Al-Hamdani. 2018. Effect of aqueous extract of *Melia azedarach* L., *Anastatica hierochuntic* and enrofloxacin antibiotic on live broiler performance. Eurasia Proc. Sci. Technol. Eng. Math (EPSTEM). 3: 110-115.

Amrullah, I. K. 2004. Nutrisi ayam broiler. Lembaga Satu Gunungbudi, Bogor.

Anes, U. C., H. Nettey, dan J. V. Jen. 2017. Antimicrobial activity and characterization of *Annona muricata* Linn. (Annonaceae) leaf-loaded chitosan nanoparticle against cancer associated microbes. Int. J. Res. Stud. Microbiol. Biotechnol. 2: 15-21.

Anjum, N., S. Maqsood, T. Masud, A. Ahmad, dan A. Momin. 2013. *Lactobacillus acidophilus*: Characterization of the species and application in food production. Crit. Rev. Food. Sci. Nutr. 54: 1241-1251.

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GADJAH MADA
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Ansari, J., S. H. Khan, A. U. Haq, dan M. Yousaf. 2012. Effect of the levels of *Azadirachta indica* dried leaf meal as phytogenic feed additive on the growth performance and haemato-biochemical parameters in broiler chicks. J. Appl. Anim. Res. 40: 336-345.

Apajalahti, J. H. A., A. Kettunen, M. R. Bedford, and W. E. Holben. 2001. Percent G+C profiling accurately reveals diet-related differences in the gastrointestinal microbial community of broiler chickens. Appl. Environ. Microbiol. 67: 5656-5667.

Apajalahti, J., A. Kettunen, dan H. Graham. 2004. Characteristic of the gastrointestinal microbial communities, with special reference to the chicken. Worlds. Poult. Sci. J. 60: 223-232

Ashafa, A. O. Tom., L. O. Orekoya, dan M. T. Yakubu. 2012. Toxicity profile of ethanolic extract of *Azadirachta indica* stem bark in male Wistar rats. Asian Pac. J. Trop. Biomed. 2: 811-817.

Assuncao, P. D. S. A., H. H. D. C. Mello, A. G. Mascarenhas, M. A. Andrade, K. A. Teixeira, H. F. D. Oliveira, dan D. P. Carvalho. 2019. Use of neem (*Azadirachta indica*) as a substitute for antimicrobial drugs in broiler chickens' feed. J. Ciênc. Anim. Bras. 20: 1-9.

Athanasiadou, S., I. Kyriazakis, F. Jackson, dan R. L. Coop. 2001. Direct anthelmintic effects of condensed tannins towards different gastrointestinal nematodes of sheep*: in vitro* and *in vivo* studies. Vet. Parasitol. 99: 205-219.

Avadi, M. R., A. M. M. Sadeghi, N. Mohammadpour, S. Abedin, F. Atyabi, R. Dinarvand, dan M. Rafiee-Tehrani. 2010. Preparation and characterization of insulin nanoparticles using chitosan and Arabic gum with ionic gelation method. Nanomed-Nanotechnol. Biol. Med. 6: 58-63.

Aviagen. 2019. Ross PM3 Broiler: Performance Objectives. http://ap.aviagen.com/techcenter/download/1341/RossPM3BroilerPO2019-EN.pdf. Diakses tanggal 16 Oktober 2019.

Awad, W. A., K. Ghareeb, S. Nitsch, S. Pasteiner, S. Abdel-Raheem, dan J. Bohm. 2008. Effects of dietary inclusion of prebiotic, probiotic and synbiotic on the intestinal glucose absorption of broiler chickens. Int. J. Poult. Sci. 7: 686-691.

Awad W. A., A. Molnar, J. R. Aschenbach, K. Ghareeb, B. Khayal, and C. Hess. 2015. *Campylobacter* infection in chickens modulates the intestinal epithelial barrier function. Innate Immun. 21: 151-160.

Ayoola, A. A., L. T. Egbeyale, D. A. Ekunseitan, A. V. Adogoke, dan O. P. Adeyeri. 2015. The effect of neem (*Azadirachta indica)* leaf meal on the growth performance and carcass chacarteristics of broiler chickens. Niger. J. Anim. Prod. 42: 141-150.

Badran M. M., E. I. Taha, M. M. Tayel, dan S. A. Al-Suwayeh. 2014. Ultra-fine self nanoemulsifying drug delivery system for transdermal delivery of meloxicam: dependency on the type of surfactants. J. Mol. Liq. 190: 16-22.

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GADJAH MADA
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Bahreini, E., K. Aghaiypour, R. Abbasalipourkabir, A. R. Mokarram, M. T. Goodarzi, dan M. Saidijam. 2014. Preparation and nanoencapsulation of l-asparaginase II in chitosantripolyphosphate nanoparticles and *in vitro* release study. Nanoscale Res. Lett. 9: 340-353.

Balakumar, K., C. V. Raghavan, N. T. Selvan, R. H. Prasad, dan S. Abdu. 2013. Self nanoemulsifying drug delivery system (SNEDDS) of rosuvastatin calcium: design, formulation, bioavailability and pharmacokinetic evaluation. Colloids Surf B: Biointerfaces. 112: 337-343.

Banes, S. S., Kususiyah, dan Y. Fenita. 2017. Pengaruh ekstrak daun katu (*Sauropus androgynus*) fermentasi terhadap kualitas karkas broiler. Jurnal Sain Peternakan Indonesia. 12: 199-208.

Barnes, E. M., C. S. Impey, dan D. M. Cooper. 1980. Manipulation of the crop and intestinal flora of the newly hatched chick. Am. J. Clin. Nutr. 33: 2426-2433.

Baurhoo, B., P. R. Ferket, dan X. Zhao. 2009. Effects of diets containing different concentrations of mannanoligosaccharide or antibiotics on growth performance, intestinal development, cecal and litter microbial populations, and carcass parameters of broilers. Poult. Sci. 88: 2262-2272.

Beg, M. A. H., M. Z. U. Rubel, M. Aftabuzzaman, M. T. A. Nahid, dan M. Begum. 2018. Efficacy of neem leaf (*Azadirachta indica*) meal as an alternative to antibiotic in broiler ration. Asian J. Res. Anim. Vet. Sci. 2: 1-10.

Blair, R. 2008. Nutrition and feeding of organic poultry. Cromwell Press. Trowbridge. London.

Bona, A. D. dan F. Nedel. 2014. Evaluation of *Melia azedarach* extracts against S*treptococcus mutans*. J. Med. Food. 0: 1-5.

Bovera, F., A. Lestingi, F. Lannaccone, A. Tateo, dan A. Nizza. 2012. Use of dietary mannanoligosaccharides during rabbit fattening period: Effects on growth performance, feed nutrient digestibility, carcass traits, and meat quality. J. Anim. Sci. 90: 3858-3866.

Brito, B. G., L. C. J. Gaziri, dan M. C. Viddoto. 2003. Virulence factors and clonal relationship among *Escherichia coli* strain isolated from broiler chickens with cellulitis. Infect Immun. 71: 4175-4177.

Buragohain, R. dan G. Kalita. 2010. Assessment of mortality pattern of broiler under intensive system of management in Mizoram. Tamil-Nadu. J. Vet. Anim. Sci. 6: 239-241.

Cahyono, D., M. C. Padaga, dan M. E Sawitri. 2013. Kajian kualitas mikrobiologis total plate count (TPC), *Enterobacteriaceae* dan *Staphylococcus aureus* susu sapi segar di Kecamatan Krucil Kabupaten Probolinggo*.* Jurnal Ilmu dan Teknologi Hasil Ternak. 8: 1-8.

Cala, A. C., A. C. S. Chagas, M. C. S. Oliveira, A. P. Matos, L. M. F. Borges, L. A. D. Sousa, F. A. Souza, dan G. P. Oliveira. 2012. *In vitro* anthelmintic effect of *Melia azedarach* L. and *Trichilia claussenii* C. against sheep gastrointestinal nematodes. J. Exp. Parasitol. 130: 98-102.

Card, L. E, dan M. C. Nesheim. 1972. Poultry Production. 11th Edition. Lea and Fibeger, Philadelphia.

UNIVERSITAS
GADJAH MADA
**Pengaruh Suplementasi Nano Enkapsulasi Ekstrak Daun Mindi (Melia azedarach L.) Melalui Air Minum
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Carpinella, M. C., L. M. Giorda, C. G. Ferrayoli, dan S. M. Palacios. 2003. Antifungal effects of different organic extracts from *Melia azedarach* L. on phytopathogenic fungi and their isolated active components. J. Agr. Food Chem. 51: 2506-2511.

Cha, D. S. dan M. S. Chinnan. 2004. Biopolymer-Based Antimikrobial Packaging: “A review”. Crit. Rev. Food Sci. Nutr. 44: 223-237.

Chattopadhyay, D., G. Arunachalam, L. Ghosh, K. Rajendran, A. B. Mandal, dan S. K. Bhattacharya. 2005. Antipyretic activity of *Alstonia macrophylla* Wall ex A. DC: An ethnomedicine of Andaman Islands. J. Pharm. Pharm. Sci. 8: 558-564.

Chiffelle, I. G., A. F. Huerta, dan D. R. Lizana. 2009. Physical and chemical characterization of *Melia azedarach* L. fruit and leaf for use as botanical insecticide. Chil. J. Agr. Res. 69: 38-45.

Choct, M. 2009. Managing gut health through nutrition. Br. Poult. Sci. 50: 9-15.

Christaki, E., P. Florou-Paneria, I. Giannenas, M. Papazahariadoub, N. A. Botsoglou, dan A. B. Spais. 2004. Effect of a mixture of herbal extracts on broiler chickens infected with *Eimeria tenella*. Anim. Res. 53: 137-144.

Cohen, N., H. Ennaji, B. Bouchrif, M. Hassar, dan H. Karib. 2007. Comparative study of microbiological quality of raw poultry meat at various seasons and for different slaughtering processes in Casablanca (Morocco). J. Appl. Poult. Res. 16: 502-508.

Coloe, P. J., T. J. Bagust, dan L. Ireland. 1984. Development of the normal gastrointestinal microflora of spesific pathogen-free chickens. J. Hyg. 92: 79-87.

Cosby, D. E., N. A. Cox, M. A. Harrison, J. L. Wilson, R. J. Buhr, dan P. J. Fedorka-Cray. 2015. *Salmonella* and antimicrobial resistance in broilers: A review. J. Appl. Poult. Res. 24: 408-426.

Couvreur, P., B. Kante, V. Lenaerts, V. Scailteur, M. Roland, dan P. Speiser. 2002. Tissue distribution of antitumor drugs associated with polyalkylcyanoacrylate nanoparticles. J. Pharm. Sci. 69: 199-202.

Cowan, M. M. 1999. Plant products as antimicrobial agents. Clin. Microbiol. Rev. 12: 564-582.

Cruickshank, G. 2001. Botanical growth enhancers offer natural option for broiler growers. Poult. World 10: 19-22.

Cushnie, T. dan A. J. Lamb. 2016. Antimicrobial activity of flavonoids. International J. Antimicrob. Agents. 26: 343-356.

Danaei, M., M. Dehghankhold, S. Ataei, F. Hasanzadeh Davarani, R. Javanmard, A. Dokhani, S. Khorasani, dan M. R. Mozafari. 2018. Impact of particle size and polydispersity index on the clinical applications of lipidic nanocarrier systems. Pharm. 10: 57.

Dash, S. P., S. Dixit, dan S. Sahoo. 2017. Phytochemical and biochemical characterizations from leaf extracts from *Azadirachta indica*: An important medicinal plant. Biochem. Anal. Biochem. 6: 1-4.

UNIVERSITAS
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Deb, K., A. Kaur, S. Ambwani, dan T. K. Ambwani. 2018. Preliminary phytochemical analyses of hydromethanolic leaf extract of *Melia azedarach* L. J. Med. Plants. Stud. 6: 04-08.

Deshpande, P. K., R. Gothalwal, dan A. K. Pathak. 2014. Phytochemical analysis and evaluation of antimalarial activity of *Azadirachta indica.* Pharma Innovation. 3: 12-16.

Devendra, B. N., N. Srinivas, V. S. S. L. Prasad, P. S. Talliuri, dan Latha. 2011. Antimicrobial activity of *Moringa olifera* leaf extract against selected bacterial and fungal strains. Int. J. Pharm. Biol. Sci. 2: 32-37.

Dewandari, K. T., S. Yuliani, dan S. Yasni. 2013. Extraction and characterization nanoparticle red betel leaf (*Piper crocatum*). Indones. J. Agric. Postharvest Res. 10: 58-65.

Dobrogosz, W. J., B. L. Black, dan I. A. Casas. 1991. Delivery of viable *Lactobacillus reuteri* to the gastrointestinal tract of poultry. Poult. Sci. 70:158 (Abstr).

Doeschate, R. A. H. M. T., C. W. Scheele, V. V. A. M. Schreurs, and J. D V. D. Klis. 1993. Digestibility studies in broiler chickens: Influence of genotype, age, sex and methode of determination. Br. Poult. Sci. 34: 131-146.

Dono, N. D. 2012. Nutritional strategies to improve enteric health and growth performance of poultry in the post antibiotic era. Thesis. Vet. Life. Sci. University of Glasgow. Scotland.

Dono, N. D. 2013. Turmeric (*Curcuma longa* Linn.) supplementation as an alternative to antibiotics in poultry diets. Wartazoa. 23: 41-49.

Duke, G. E. 1989. Relationship of cecal and colonic motility to diet, habitat, and cecal anatomy in several avian species. J. Exp. Zool. Suppl. 3: 38-47

Durrani, F. R., N. Chand, M. Jan, A. Sultan, Z. Durrani, dan S. Akhtar. 2008. Immunomodulatory and growth promoting effects of neem leaves infusion in broiler chicks. Sarhad. J. Agric. 24: 655-660.

Edens, F. W. 2003. An alternative for antibiotic use in poultry: probiotics. Braz. J. Poultry. Sci. 5: 75-97.

Edjeng, S. dan R. Kartasudjana. 2006. Manajemen Ternak Unggas. Penebar Swadaya. Jakarta.

Elfalleh, W., N. Tlili, N. Nasri, Y. Yahia, H. Hannachi, N. Chaira, M. Ying, dan A. Ferchichi. 2011. Antioxidant capacities of phenolic compounds and tocopherols from Tunisian Pomegranate (*Punica granatum*) fruits. J. Food Sci. 76: 707-713.

Emma, W. M. S. M., O. Sjofjan, E. Widodo, dan Achmanu. 2013. Karakteristik usus halus ayam pedaging yang diberikan asam jeruk nipis dalam pakan. Jurnal Veteriner. 14: 105-110.

Ensminger, M. E., J. E. Oldfield, dan W. W. Heinemann. 1990. Feeds and Nutrition. 2nd Edition. Ensminger Publishing Company, California.

UNIVERSITAS
GADJAH MADA
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Esfanjani, A. F. dan S. M. Jafari. 2016. Biopolymer nano-particles and natural nano-carriers for nano-encapsulation of phenolic compounds. Colloids. Surf. B: Biointerfaces. 146: 532–543.

Ewing, W. N. dan D. J. A. Cole. 1994. The living gut: An introduction to microorganisms in nutrition. Dungannon, UK: Context Publication: 220p.

Ezzat, S. S. Abood, dan H. SA. Jawad. 2018. A review on the effects of neem (*Azadirachta indica*) as feed additive in poultry production. J. Entomol. Zool. Stud. 6: 1331-1333.

FAO/WHO. 2002. Working group report on drafting guidelines for the evaluation of probiotics in food, 30 April to 1 May, London, United Kingdom, and Ontario, Canada.

Fard, S. H., M. Toghyani, dan S. A. Tabeidian. 2014. Effect of oyster mushroom wastes on performance, immune responses and intestinal morphology of broiler chickens. Int. J. Recycl. Org. Waste Agric. 3: 141-146.

Feddes, J. J., E. J. Emmanuel, dan M. J. Zuidhoft. 2002. Broiler performance, body weight variance, feed and water intake, and carcass quality at different stocking densities. Poult. Sci. 81: 774-779.

Fernandes, J. C., M. J. Tiera, dan F. M. Winnik. 2006. Chitosan nanoparticles for non-viral gene therapy. ACS. Symp. 934: 177-200.

Fernandes, B. C. S., M. R. F. B. Martins, A. A. Mendes, E. L. Milbradt, C. Sanfelice, B. B. Martins, E. F. Aguiar, dan C. Bresne. 2014. Intestinal integrity and performance of broiler chickens fed a probiotic, a prebiotic, or an organic acid. Braz. J. Poultry Sci. 16: 417-424.

Foulquie, M. R., P. Sarantinopoulos., E. Tsakalidou, dan D. L. Vuyst. 2006. The role and application of enterococci in food and health. Int. J. Food Microbiol. 106:1-24.

Friedman, M., R. Buick, dan C. T. Elliott. 2004. Antibacterial activities of naturally occurring compounds against antibiotic–resistant *Bacillus cereus* vegetative cells and spores, *Escherichia coli*, and *Staphylococcus aureus*. J. Food Prot. 67: 1774-1778.

Fuller, R. 1984. Microbial activity in the alimentary tract of birds. Pages 55-61 in Proc. The Nutrition Society. Cambridge University. Cambridge.

Fufa, M. F., F. Deressa, T. Deyou, dan N Abdisa. 2018. Isolation and characterization of compounds from the leaves of *Melia azedarach* and stem bark of *Albizia schimperiana* and evaluation for antimicrobial activities. Medicinal Chemistry. 8: 154-165.

Gaggia, F., P. Mattarelli, dan B. Biavati. 2010. Probiotics and prebiotics in animal feeding for safe food production. Int. J. Food Microbiol. 141: S15-S28.

Gao, Y. dan Shan, A. S. 2004. Effects of different oligosaccharides on performance and availability of nutrients in broilers. J. Northeast Agric. Univ. 11: 37-41.

Gauthier, R. 2002. Intestinal health, the key to productivity (The case of organic acid). XXVII Convencion ANECA-WPDC. Puerto Vallarta, Jal. Mexico.

UNIVERSITAS
GADJAH MADA
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Ghazanfari, S. I., Mohammadi, Z. I, dan Moradi, M. I. I. 2015. Effects of Coriander essential oil on the performance, blood characteristics, intestinal microbiota and histological of broilers. Braz. J. Poultry Sci. 17: 419-426.

Gibson, G. R. dan M. Roberfroid. 1995. Dietary modulation of the human colonic microbiota: introducing the concept of prebiotics. Nutr. J. 125: 1401-1412.

Gong, J., R. J. Forster, H. Yu, J. R. Chambers, R. Wheatcroft, P. M. Sabour, dan S. Chen. 2002. Molecular analysis of bacterial populations in the ileum of broiler chickens and comparison with bacteria in the caecum. FEMS Microbiol. Ecol. 41: 171-179.

Grashorn, M. A. 2010. Use of phytobiotics in broiler nutrition-an alternative to infeed antibiotics?. J. Anim. Feed Sci. 19: 338-347.

Guhne, W. 1970. Tenderness of broiler meat dependent on weight, sex, and age of the birds. Worlds. Poult. Sci. 26: 739 (Abstr).

Guo, F. C., B. A. Williams, R. P. Kwakkel, H. S. Li, X. P. Li, J. Y. Luo, W. K. Li, dan M. W. Verstegen. 2004. Effects of mushroom and herb pollysaccarides as alternatives for an antibiotic on the cecal microbial ecosystem in broiler chickens. Poult. Sci. 83: 175-182.

Gupta, R. dan B. Kompella. 2006. Nanoparticle technology for drug delivery. Drug. Pharm. Sci: 159.

Hajimehdipoor, H., A. R. Gohari, Y. Ajani, dan S. Saeidnia. 2014. Comparative study of the total phenol content and antioxidant activity of some medicinal herbal extracts. Res. J. Pharm. 1: 21-25.

Hajrawati, M. Fadliah, Wahyuni, dan I. I. Arief. 2016. Kualitas fisik, mikrobiologis, dan organoleptik daging ayam broiler pada pasar tradisional di Bogor. Jurnal Ilmu Produksi dan Teknologi Hasil Peternakan. 4: 386-389.

Hamid, A., Sulasmi, dan F. Jamin. 2014. Kemampuan ekstrak daun bandotan (*Ageratum conyzaide*) terhadap jumlah bakteri pada usus ayam broiler. Jurnal Medika Veterinaria. 8: 117-119.

Harborne, J. B. 1987. Metode Fitokimia. Institut Teknologi Bandung. Bandung.

Hariana, A. 2006. Tumbuhan Obat dan Khasiatnya. Seri 1. Penebar Swadaya. Jakarta.

Harimurti, S. dan E. S. Rahayu. 2009. Morfologi usus ayam broiler yang disuplementasi dengan probiotik strain tunggal dan campuran. AGRITECH. 29: 179-183.

Hashemi, S. R., I. Zulkifli, M. Hair-Bejo, M. Karami, dan A. F. Soleimani. 2009. The effect of *Euphorbia hirta* and acidifier supplementation on growth performance and antioxidant activity in broiler chickens. Pages 215-217 in Proc. The 21st Veterinary Association Malaysia (VAM) Congress. Universiti Putra Malaysia. Malaysia.

Hashemi, S. R. dan H. Davoodi. 2010. Phytogenics as New Class of Ffeed Additive in Poultry Industry. J. Anim. Vet. Adv. 9: 2295-2304.

UNIVERSITAS
GADJAH MADA
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Herawati, 2008. Produksi karkas, hasil olahan dan perubahan histology organ dan jaringan ayam broiler dengan suplemen fitobiotik jahe merah. Disertasi. Program Studi Ilmu Peternakan. Sekolah Pascasarjana. Universitas Gadjah Mada. Yogyakarta.

Heres, L., B. Engel, H. A. P. Urlings, J. A. Wagenaar, dan F. V. Knapen. 2004. Effect of acidified feed on susceptibility of broiler chickens to intestinal infection by *Campylobacter* and *Salmonella*. Vet. Microbiol. 99: 259-267.

Hofacre, C. L. 2001. Necrotic enteritis, currently a billion dollar disease: Is there anything new on the horizon? In science and technology in the feed industry. Pages 79-86 in Proc. Alltech's 17th Annual Symposium, eds. Lyons TP and Jacques KA. Nottingham University Press, Nottingham, UK.

Honikel, K. O. dan R. Hamm. 1994. Measurement of water holding capacity and juiceness. pada quality attributes and their measurement in meat, poultry and fish products. Adv. Meat Res. 9 Ed.By Pearson, A.M. dan T.R. Dutson. Blackie Academic & Professional Glasgow, UK.

Huang, R. L., Y. L. Yin, dan M. X. Li. 2007. Dietary oligochitosan supplementation enhances immune status of broilers. J. Sci. Food Agric. 87: 153-159.

Hussain, Z. dan S. Sahudin. 2016. Preparation, characterisation and colloidal stability of chitosantripolyphosphate nanoparticles: Optimisation of formulation and process parameters. Int. J. Pharm. Pharm. Sci. 8: 297-308.

Huyghebaert, G., R. Ducatelle, and F. V. Immerseel. 2011. An update on alternatives to antimicrobial growth promoters for broilers. Vet. J. 187: 182-188.

Incharoen, T., K. Yamauchi, dan N. Thongwittaya. 2010. Intestinal villus histological alterations in broilers fed dietary dried fermented ginger. J. Anim. Physiol. Anim. Nutr. 94: e130-e137.

Jabeen, K., A. Javaid, E. Ahmad, dan M. Athar. 2011. Antifungal compounds from *Melia azedarach* leaves for management of *Ascochyta rabiei*, the cause of chickpea blight. Nat. Prod. Res. 25: 264-276.

Jain, B., H. K. Daima, S. Kachhwaha, dan S. L. Kothari. 2008. Synthesis of plant-mediated silver nanoparticles using papaya fruit extract and evaluation of their antimicrobial activities. Dig. J. Nanomater. Bios. 4: 557-563.

Jamroz, D., T. Wertelecki, M. Houszka, dan C. Kamel. 2006. Influence of diet type on the inclusion of plant origin active substances on morphological and histochemical characteristics of the stomach and jejunum walls in chicken. J. Anim. Physiol. Anim. Nutr. 90: 255-268.

Jang, I. S., Y. H. Ko, S. Y. Kang, dan C. Y. Lee. 2007. Effect of a commercial essential oil on growth performance, digestive enzyme activity and intestinal microflora population in broiler chickens. Anim. Feed Sci. Technol. 134: 304-315.

Jeon, Y. J., P. J. Park, dan S. K. Kim. 2001. Antimicrobial effect of chitooligosaccharides produced by bioreactor. Carbohydr. Polym. 44: 71-76

UNIVERSITAS
GADJAH MADA
**Pengaruh Suplementasi Nano Enkapsulasi Ekstrak Daun Mindi (Melia azedarach L.) Melalui Air Minum
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Jiang, H. Q., L. M. Gong, Y. X. Ma, Y. H. He, D. F. Li, dan H. X. Zhai. 2006. Effect of stachyose supplementation on growth performance, nutrient digestibility and caecal fermentation characteristics in broilers. Br. Poult. Sci. 47: 516-522.

Jumiati, S., Nuraini, dan R. Aka. 2017. Bobot potong, karkas dan giblet lemak abdominal ayam broiler yang temulawak (*Curcuma xanthorhiza,* Roxb) dalam pakan. Jurnal Ilmu dan Teknologi Peternakan Tropis. 4: 11-19.

Kamal, M. 1997. Pengontrolan Kualitas Pakan Ternak. Diktat Kuliah. Laboratorium Makanan Ternak. Jurusan Nutrisi dan Makanan Ternak. Fakultas Peternakan. Universitas Gadjah Mada. Yogyakarta

Kaneria, M., Y. Baravalia, Y. Vaghasiya, dan S. Chanda. 2009. Determination of antibacterial and antioxidant potential of some medicinal plants from Saurashtra region, India. Indian J. Pharm. Sci. 71: 406-412.

Katsube, T., H. Tabata, Y. Ohta, Y. Yamasaki, E. Anuurad, K. Shiwaku, dan Y. Yamane. 2004. Screening for antioxidant activity in edible plant products: Comparision of low density lipoprotein oxidation assay. J. Agr. Food Chem. 52 :2391-6.

Kaur, S. P., R. Rao, A. Hussain, dan S. Khatkar. 2011. Preparation and characterization of rivastigmine loaded chitosan nanoparticles. J. Pharm. Sci. Res. 3: 1227-1232.

Kellems, R. O. dan D. C. Church. 2010. Livestock feeds and feeding. Sixth edition. Prentice hall, Pearson. New Jersey.

Kelly, D. dan S. Conway. 2001. Genomics at work: The global gene response to enteric bacteria. Gut. 49: 612-613.

Khan, I., M. M. Yasinzai, Z. Mehmood, I. Ilahi, J. Khan, A. T. K, M. S. Saqib, dan W. U. Rahman. 2014. Comparative study of green fruit extract of *Melia Azedarach* Linn. with its ripe fruit extract for antileishmanial, larvicidal, antioxidant and cytotoxic activity. Am. J. Phytomed. Clin. Ther. 2: 442-454

Knarreborg, A., M. A. Simon, R. M. Engberg, B. B. Jensen, dan G. W. Tannock. 2002. Effects of dietary fat source and subtherapeutic levels of antibiotic on the bacterial community in the ileum of broiler chickens at various ages. Appl. Envir. Microbiol. 68: 5918-5924.

Krishnaiah, D., A. Bono, R. Sarbatly, R. Nithyanandam, dan S. M. Anisuzzaman. 2015. Optimisation of spray drying operating conditions of Morinda citrifolia L. fruit extract using response surface methodology. J. King Saud Univ. Eng. Sci. 1: 26-36.

Krismiyanto, L., N. Suthama, dan H. I. Wahyuni. 2015. Keberadaan bakteri dan perkembangan *caecum* akibat penambahan inulin dari umbi Dahlia (*Dahlia variabilis*) pada ayam kampung persilangan periode starter. Jurnal Ilmu-Ilmu Peternakan. 24: 54-60.

Kucukyilmaz, K. M. Bozkurt, A. U. Cath, E. N. Herken, M. Cunar, dan E. Bintas. 2012. Chemical composition, fatty acid profile and colour of broiler meat as affected by organic and conventional rearing systems. S. Afr. J. Anim. Sci. 42 :360-368.

UNIVERSITAS
GADJAH MADA
**Pengaruh Suplementasi Nano Enkapsulasi Ekstrak Daun Mindi (Melia azedarach L.) Melalui Air Minum
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Kurniasih, M. dan D. Kartika. 2009. Aktivitas antibakteri kitosan terhadap bakteri *S. aureus.* Molekul. 4: 1-5.

Kuzma, J. 2010. Nanotechnology in animal production-upstream assessment of applications. Livest. Sci. 130: 14-24.

Landy, N., G. H. Ghalamkari, dan M. Toghyani. 2011. Performance, carcass characteristics, and immunity in broiler chickens fed dietary neem (*Azadirachta indica*) as alternative for an antibiotic growth promoter. Livest. Sci. 142: 305-309.

Langlois, I. 2003. The anatomy, physiology, and diseases of the avian proventriculus and ventriculus. Vet. Clin. Exot. Anim. Pract. 6: 85-111.

Laudadio, V., L. Passantino, A. Perillo, G. Lopresti, A. Passantino, R. U. Khan, dan V. Tufarelli. 2012. Productive performance and histological features of intestinal mucosa of broiler chickens fed different dietary protein levels. Poult. Sci. 91: 265-270.

Lawrie, D. J. 1995. Ilmu Daging. Edisi ke lima. Diterjemahkan oleh Aminuddin Parakkasi dan Yuda Amwila. Universitas Indonesia Press. Jakarta.

Lawrie R. 2003. Ilmu Daging Terjemahan Aminuddin Prakkasi. Jakarta (ID): Universitas Indonesia Press.

Lenhardt, L. dan S. Mozes. 2003. Morphological and funchional changes of small intestine in growth-stunted broilers. Acta Vet. 72: 353-358.

Leeson, and J. D. Summer. 1980. Production and carcass characteristic of the broiler chicken. Poult. Sci. 59: 786-798.

Luckstadt, C. 2014. Effects of dietary potassium diformate on growth and gastrointestinal health in weaned piglets in Vietnam. Pages 17-19 in Conference on International Research on Food Security, Natural Resource Management and Rural Development organized by the Czech University of Life Sciences Prague. Kota?

Lutful, K. S. M. 2010. Avian colibacillosis and salmonellosis: a closer look at epidemiology, pathogenesis, diagnosis, control and public health concerns. Int. J. Environ. Res. Public Health. 7: 89-114.

Lyon, C. E. dan R. L. Wilson. 1986. Effects of sex, rigor condition, and heating method on yield and objective texture of broiler breast meat. Poult. Sci. 65: 907-914.

Maciel, M. V., S. M. Morais, C. M. L. Bevilaqua, A. L. F. Camurça-Vasconcelos, C. T. C. Costa, dan C. M. S. Castro. 2006. Ovicidal and larvicidal activity of *Melia azedarach* extracts on *Haemonchus contortus.* 140: 98-104. Vet. Parasitol.

Mahmood, S., A. Rehman, M. Yousaf, P. Akhtar, G. Abbas, K. Hayat, A. Mahmood, dan M. K. Shahzad. 2015. Comparative efficacy of different herbal plant's leaf extract on haematology, intestinal histomorphology and nutrient digestibility in broilers. Adv. Zool. Bot. 3: 11-16.

UNIVERSITAS
GADJAH MADA
**Pengaruh Suplementasi Nano Enkapsulasi Ekstrak Daun Mindi (Melia azedarach L.) Melalui Air Minum
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Mardliyati, E., S. E. Muttaqien, dan D. R. Setyawati. 2012. Sintesis nanopartikel kitosan dengan metode gelasi ionik: Pengaruh konsentrasi dan rasio volume terhadap karakteristik partikel. Halaman 90-93 pada Prosiding Pertemuan Ilmiah Ilmu Pengetahuan dan Teknologi Bahan 2012. Pusat Teknologi Farmasi dan Medika – BPPT. Serpong. Indonesia.

McNaught, C. E. dan J. MacFie, 2000. Probiotics in clinical practice: a critical review of the evidence. Nutr. Res. 21: 343-353.

Mellata, M., M. Dho-Moulin, C. M. Dhozois, M. Curtiss, P. K. Brown, P. Arne, A. Bree, C. Dasautells, dan J. M. Fairbrother. 2003. Role of virulence factors in resistence of avian pathogenic *Escherichia coli* to serum and in pathogenity. Infect. Immun. 71: 536-540.

Menteri Pertanian Republik Indonesia. 2017. Peraturan Menteri Pertanian Republik Indonesia tentang Klasifikasi Obat Hewan. Jakarta.

Meziane, M. dan H. Goumri. 2014. The antimicrobial effect of extracts of M*elia azedarach* on some pathogenic microorganisms. Int. J. Appl. Nat. Sci. (IJANS). 3: 173-180

Miles, R. D., G. D. Butcher, P. R. Henry, dan R. C. Littell. 2006. Effecf of antibiotic growth promoters on broiler performance, intestinal growth parameters, and quantitative morphology. J. Poult. Sci. 85: 476-485.

Morel, P. C. H., J. A. Timmers, T. A. T. H. De Wit, G. R. Wood, R. Sheriff, B. J. Camden, D. V. Thomas, dan V. Ravindran. 2001. Prediction of feed intake in modern broilers. Pages 152-155 in Proc. Australian Poultry Science Symposium. University of Sydney, Sydney, NSW: World's Poultry Science Association.

Motiei, M., S. Kashanian, L. A. Lucia, dan M. Khazaei. 2017. Intrinsic parameters for the synthesis and tuned properties of amphiphilic chitosan drug delivery nanocarriers. J. Controlled Release. 260: 213-225.

Munir, T., A. Mohyuddin, Z. Khan, dan R. Haq. 2017. Exploration of antibacterial potential of *Melia azedarach* L. Sci. Inquiry Rev. 1: 8-11.

Mwale, M., J. F. Mupangwa, dan C. Mapiye. 2008. Growth performance of guinea fowl keets fed graded levels of baobab seed cake diets. Int. J. Poult. Sci. 7: 429-432.

Muzzarelli, R., R. Tarsi, O. Filippini, E. Giovanetti, G. Biagini, dan P. E. Varaldo, 1990. Antimicrobial properties of N-carboxybutyl chitosan. Antimicrob Agents Chemother. 34: 2019-2023.

Nerome, K., K. Shimizu, S. Zukeran, Y. Igarashi, K. Kuroda, S. Sugita, T. Shibata, Y. Ito, dan R. Nerome. 2018. Functional growth inhibition of influenza A and B viruses by liquid and powder components of leaves from the subtropical plant *Melia azedarach* L. Arch. Virol. 163: 2099-2109.

Neves, D. P., T. M. Banhazi, dan I. A. Naas. 2014. Feeding behaviour of broiler chickens : a review on the biomechanical characteristics. Braz J. Poult. Sci. 16: 1-16.

UNIVERSITAS
GADJAH MADA
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Ningsih, N., B. Ariyadi, N. D. Dono, Supadmo, dan Zuprizal. 2019. The effect of nanoencapsulated *Phaleria macrocarpa* fruits extract in drinking water on jejunal histomorphology of broiler chickens. Trop. Anim. Sci. J. 42: 106-112.

No, H. K., N. Y. Park, S. H. Lee, dan S. P. Meyers. 2002. Antibacterial activity of chitosans and chitosan oligomers with different molecular weights. Int. J. Food Microbiol. 74: 65-72.

Nodu, M. B., M. Okpeku, Z. A. Akpoveta, dan D. O. Iregbu. 2017. Evaluation of azadirachta indica leave extract on hematology and biochemical profiles, organs weight and growth parameters of broiler chickens. 32: 1879-1884.

North, M. O. dan D. D. Bell . 1990. Commercial Chicken Production Manual. 4Th Edition. Van Northland Reinhold. New York.

Novele, D. J., J. W. Ng'ambi, D. Norris, dan C. A. Mbajiorgu. 2008. Effect of sex, level and period of feed restriction during the starter stage on productivity and carcass characteristics of Ross 308 broiler chickens in South Africa. Int. J. Poult. Sci. 7: 530-537.

Noy, Y. dan D. Sklan. 1999. Different types of early feeding and performance in chicks and poults. J. Appl. Poult. Res. 8: 16-24.

Noy, Y. dan D. Sklan. 2001. Yolk and exogenous feed utilization in the posthatch chick. Poult. Sci. 80: 1490-1495.

Nurkhasanah, B., U. Santoso, dan K. Kususiyah. 2017. Pengaruh suplementasi ekstrak daun katuk (*Sauropus androgynus*) dan tepung kunyit (*Curcuma domestica*) terhadap kualitas karkas pada broiler yang diberi pakan berprotein rendah. Jurnal Sain Peternakan Indonesia. 12: 230-238.

Ockerman, H. W. dan J. Szczawinski. 2006. Effect of electrical stimulation on the microflora meat. J. Food Sci. 48: 1004-1005.

Okeudo, N. J., K. V. Eboh, V. Ndidi, Izogboekwe, dan E. C. Akanno. 2005. Growth rate, carcass characteristic and organoleptic quality of broiler fed graded levels of palm karnel cake. J. Poult. Sci. 4: 330-333.

Oktaviana, D. 2009. Pengaruh pemberian ampas virgin coconut oil dalam ransum terhadap performan, produksi karkas, perlemakan, antibodi, dan mikroskopik otot serta organ pencernaan ayam broiler. Tesis. Fakultas Peternakan. UGM. Yogyakarta.

Olnood, C. G., S. S. M. Beski, M. Choct, dan P. A. Iji. 2015. Novel probiotics: Their effects on growth performance, gut development, microbial community and activity of broiler chickens. Anim. Nutr. 1: 184-191.

Olukosi, O. A. dan N. D. Dono. 2014. Modification of digesta pH and intestinal morphology with the use of benzoic acid or phytobiotics and the effects on broiler chicken growth performance and energy and nutrient utilization. J. Anim. Sci. 92: 3945-3953.

Orhan, I. E., E. Guner, B. Ozcelik, F. S. Senol, S. S. Caglar, G. Emecen, O. Kocak, dan B. Sener. 2012. Assessment of antimicrobial, insecticidal and genotoxic effects of *Melia azedarach* L. (chinaberry) naturalized in Anatolia. Int. J. Food Sci. Nutr. 63: 560-565.

UNIVERSITAS
GADJAH MADA
**Pengaruh Suplementasi Nano Enkapsulasi Ekstrak Daun Mindi (Melia azedarach L.) Melalui Air Minum
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Owai, P. U. dan M. Gloria. 2010. Effects of components of *Melia azedarachta* on coccidia infections in broiler in Calabar, Nigeria. Int. J. Poult. Sci. 9: 931-934.

Owens, C. M., L. C. Cavitt, dan J. F. C. Meullenet. 2004. Tenderness evaluation in poultry meat. Pages 115-121 in Proc. of the 57th American Meat Science Association Reciprocal Meat Conference. University of Arkansas.

Papadimitriou, S., D. Bikiaris, K. Avgoustakis, E. Karavas, dan M. Georgarakis. 2008. Chitosan nanoparticles loaded with dorzolamide and pramipexole. Carbohydr. Polym. 73: 44-54.

Parmar N., N. Singla, S. Amin, dan K. Kohli. 2011. Study of cosurfactant effect on nanoemulsifying area and development of lercanidipine loaded (SNEDDS) self nanoemulsifying drug delivery system. Colloids Surf B: Biointerfaces. 86: 327-338.

Patel M. J., N. M. Patel, R. B. Patel, dan R. P. Patel. 2010. Formulation and evaluation of self-microemulsifying drug delivery system of lovastatin. Asian J. Pharm. Sci. 5: 266-275.

Patterson, J. A. and K. M. Burkholder. 2003. Application of prebiotics and probiotics in poultry production. Poult. Sci. 82: 627-631.

Peighambari, S. M., J. P. Villiancourt, R. A. Wilson, dan C. L. Gyles. 1995. Characteristic of *Echerchia coli* isolates from avian cellulitis. Avian Dis. 39: 116-124.

Pelicano, E. R. L., P. A. Souza, dan H. B. A. Souza. 2002. Prebióticos e probióticos na nutrição de aves. Ciências Agrárias e da Saúde. 2: 59-64.

Pelicano, E. R. L., P. A. Souza., H. B. A. Souza., D. F. Fegueiredo., M. M. Boiago., S. R. Carvalho, dan V. F. Bordon. 2005. Intestinal mucosa development in broilers chicken fed natural growth promoters. Braz. J. Poult. Sci. 7:221-229.

Pelczar, M. J. dan E. C. S. Chan. 1988. Dasar-Dasar Mikrobiologi. Jakarta: Universitas Indonesia Press.

Pokhrel, B., S. Raut, dan S. Rijal. 2015. Phytochemical screening, antimicrobial and antioxidant activity of *Melia azedarach* leaves in methanol solvent. World J. Pharm. Pharm. Sci. 4: 1562-1575.

Popoff, M. Y. dan L. E. LeMinor. 2005. Genus XXXIII. Salmonella: 764-799 in Brenner, D. J., N. R. Kreig, and J. T. Staley. Bergey's Manual of Systemic Bacteriology., eds. 2nd Ed. Springer, East Lansing, Michigan.

Pratikno, H. 2011. Lemak abdominal ayam broiler (*Gallus* sp) karena pengaruh ekstrak kunyit (*Curcuma domestica* Vahl.). BIOMA. 13: 1-8.

Prayitno, A. H., E. Suryanto, dan Zuprizal. 2010. Kualitas fisik dan sensoris daging ayam broiler yang diberi pakan dengan penambahan ampas virgin coconut oil (VCO). Buletin Peternakan. 34: 55-63.

Pulliainen, E. dan P. Tunkkari. 1983. Seasonal variation in the gut length of willow grouse (*Lagopus lagopus*) in Finnish Lapland. Ann. Zool. Fenn. 20: 53-56.

UNIVERSITAS
GADJAH MADA
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Qiao, M., D. L. Fletcher, D. P. Smith, dan J. K. Northcutt. 2001. The effect of broiler breast meat color on pH, moisture, water-holding capacity, and emulsification capacity. Poult. Sci. 80: 676-680.

Rafsanjani, M. K. dan W. D. R. Putri. 2015. Karakterisasi ekstrak kulit jeruk bali menggunakan metode *Ultrasonic Bath* (kajian perbedaan pelarut dan lama ekstraksi). Jurnal Pangan dan Agroindustri. 3: 1473-1480.

Raharjo, I. T., R. E. Mudawaroch, dan H. D. Arifin. 2015. pH dan keempukan daging ayam broiler pengaruh penambahan sari kunyit (C*urcumadomestica* val.) dan jahe (Z*ingiber officinale* Roscoe) pada air minum. Surya Agritama. 4: 1-10.

Rahman, F. A., T. Haniastuti, dan T. W. Utami. 2017. Skrining fitotokimia dan aktivitas antibakteri ekstrak etanol daun sirsak (*Annona muricata* L.) pada *Streptococcus mutans* ATCC 35668. Majalah Kedokteran Gigi Indonesia. 3: 1-7.

Ramadass, N. dan Subramanian, N. 2018. Study of phytochemical screening of neem (*Azadirachta indica*). Int. J. Zool. Stud. 3: 209-212.

Ramya, S., P. J. Jepachanderamohan, N. Alaguchamy, M. Kalayanasundaram, dan R. Jayakumararaj. 2009*. In vitro* antibacterial prospective of crude leaf extracts of *Melia Azedarach* Linn. against selected bacterial strains. Ethnobot. Leaflets. 13: 254-58.

Rao, Q. S. V., D. Nagalashmi, dan V. R. Redy. 2002. Feeding to Minimize Heat Stress. Poult. Int. 41: 7.

Razak, A. D., K. Kiramang, dan M. N. Hidayat. 2016. Pertambahan bobot badan, konsumsi ransum dan konversi ransum ayam ras pedaging yang diberikan tepung daun sirih (*Piper betle* Linn) sebagai imbuhan pakan. Jurnal Ilmu dan Industri Perternakan. 3: 135-147.

Redha, A. 2010. Flavonoid: struktur, sifat antioksidatif dan peranannya dalam sistem biologis. Jurnal Belian. 9: 196-202.

Rhoades, J. dan S. Roller. 2000. Antimicrobial actions of degraded and native chitosan against spoilage organisms in laboratory media and foods. Appl. Envir. Microbiol. 66: 80-86.

Rinttila, T. dan J. Apajalahti. 2013. Intestinal microbiata and metabolites-implications for broiler chickens health and performance. J. Appl. Poult. Res. 22: 647-658.

Rohma, L. N., O. Sjofjan, dan M. H. Natsir. 2019. Effect of *Curcuma zedoaria* and *Zingiber officinale* var. officinale as feed additive on intestinal villus characteristics of broiler. Int. Res. J. Adv. Eng. Sci. 4: 275-278.

Rose, S. P. 1997. Principles of Poultry Science. CAB International, London.

Rostinawati, T. 2009. Aktivitas antibakteri ekstrak etanol bunga rosella (*Hibiscus Sabdariffa* L.) terhadap *Escherichia coli, Salmonella typhi* dan *Staphylococcus aureus* dengan metode difusi agar. Fakultas Farmasi Universitas Padjadjaran. Bandung.

Rukayadi, Y. 2002. Kitin deasetilase dan pemanfaatannya. Hayati. 9: 130-134.

UNIVERSITAS
GADJAH MADA
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Saeidnia, S., N. Yassa, A. R. Gohari, dan A. Shafiee. 2005. Isolation and identification of flavonoid constituents from of *Achillea conferta* DC. J. Med. Plants. 4: 12–20.

Salih, R., E. Tesfaye, B. Tamir, dan H. Singh. 2016. Effect of feed restriction on production performance and carcass characteristics of Koekoek chicken in Ethiopia. Poult. Sci. J. 4: 55-61.

Samudram, P., R. Vasuki, H. Rajeshwari, A. Geetha, dan P. S. Moorthi. 2009. Antioxidant and antihepatotoxic activities of ethanolic crude extract of *Melia azedarach* and *Piper longum*. J. Med. Plants Res. 3: 1078-1083.

Santoso, U. 2002. Pengaruh tipe kandang dan pembatasan pakan di awal pertumbuhan terhadap performans dan penimbunan lemak pada ayam pedanging unsexed. Jurnal Ilmu Ternak dan Veteriner. 7: 84-89

Sarker, S. K., M Mostofa, F. Akter, M. M. Rahman, dan M. R. Sultana.2014. Effects of aqueous extract of Neem (*Azadirachta indica*) leaves as growth promoter and anti-colibacillosis in broilers. J. Anim. Sci. 43: 138-141.

Scott, T. A. 2005. Variation in feed intake of broiler chickens. Recent Adv. Anim. Nutr-Aust. 15: 237-244.

Seifu, D., L. E. Gustafsson, R. Chawla, S. Genet, A. Debella, M. Holst, dan P. M. Hellstrom. 2017. Antidiabetic and gastric emptying inhibitory effect of herbal *Melia azedarach* leaf extract in rodent models of diabetes type 2 mellitus. J. Exp. Pharmacol. 9: 23-29.

Sen, A. dan A. Batra. 2012. Chemical composition of methanol extract of the leaves of *Melia azedarach* L. Asian J. Pharm. Clin. Res. 5: 42-45.

Septiana, A. T. dan A. Asnani. 2012. Kajian Sifat Fisikokimia Ekstrak Rumput Laut Coklat. AGROINTEK. 6: 22-28.

Servat-Medina L., A. Gonzales-Gomez, F. Reyes-Ortega, I. M. O. Sousa, N. C. A. Queiroz, P. M. W. Zago, M. P. Jorge, K. M. Monteiro, J. E. de Carvalho, J. S. Roman, dan M. A. Foglio. 2015. Chitosan-tripolyphosphate nanoparticles as *Arrabidaea chica* standardized extract carrier: synthesis, characterization, biocompatibility, and antiulcerogenic activity. Int. J. Nanomed. 10: 3897-3909.

Shahidi, S., Y. Maziar, dan N. Z. Delaram. 2014. Influence of dietary organic acids supplementation on reproductive performance of freshwater Angelfish (*Pterophyllum scalare*). Glob. Vet. 13: 373-377.

Shanmugasundaram, R., M. Sifri, dan R. K. Selvaraj. 2013. Effect of yeast cell product supplementation on broiler cecal microflora species and immune responses during an experimental coccidial infection. Poult. Sci. 92: 1195-1201.

Shekhawat, K. K., D. V. Rao, dan A. Batra. 2013. *In vitro* antimicrobial activities of endophytic fungi isolates from medicinal tree - *Melia azedarach* L. J. Microbiol. Res. 3: 19-24.

UNIVERSITAS
GADJAH MADA
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Shu'aibu, I., J. B. Hammam, L. J. Goje, A. M. Mu'inat, H. A. Jauro, dan M. Y. Kabiru. 2015. Phytochemical analysis and evaluation of bacteriostatic effect of neem (*Azadirachta indica*) leaves on some clinical bacterial isolates. J. Harmonized Res. Appl. Sci. 3: 152-157.

Sieo, C. C., N. Abdullah, W. S. Tan, dan Y. W. Hot. 2005. Influence of *β-glucanase*-producing Lactobacillus strains on intestinal characteristics and feed passage rate of broiler chickens. J. Poult. Sci. 84: 734-741.

Silva, H. D., M. A. Cerqueira, dan A. A. Vicente. 2012. Nanoemulsions for food applications: Development and characterization. Food Bioprocess Tech. 5: 854-867.

Singh, R., S. Singh, S. Kumar, dan S. Arora. 2007. Evaluation of antioxidant potential of ethyl acetate extracts fractions of *Acacia auriculiformis* A. Cunn. Food Chem. Toxicol. 45: 1216-1223.

Sinurat, A. P., S. Bahri, S. Muharsini, W. Puastuti, A. Priyanti, I. S. Nurhayanti, dan Priyono. 2017. Kebijakan pengendalian penggunaan *antibiotic growth promoters* dan *ractopamine* dalam mendukung keamanan pangan nasional. Pusat Penelitian dan Pengembangan Peternakan, Badan Penelitian dan Pengembangan Pertanian.

Siregar, A. P. dan Sabrani. 2005. Teknik Beternak Ayam Pedaging di Indonesia. Magie Group. Jakarta.

Skinner-Noble, D. O. dan R. G. Teeter. 2003. Components of feed efficiency in broiler breeding stock: energetics, performance, carcass composition, metabolism, and body temperature. Poult. Sci. 82: 1080-1090.

Smith, D. P. dan D. L. Fletcher. 1988. Chicken breast muscle fiber type and diameter as influenced by age and intramuscular location. Poult. Sci. 67: 908-913.

Smith, D. P., C. E. Lyon, D. L. Fletcher. 1988. Comparison of the AlloKramer shear and texture profile methods of broiler breast meat texture analysis. Poult. Sci. 67: 1549-1556.

Soeparno. 1998. Komposisi karkas dan teknologi daging. Fakultas peternakan. Universitas Gadjah Mada. Yogyakarta.

Soeparno. 2005. Ilmu dan teknologi daging cetakan keempat. Gadjah Mada University Press. Yogyakarta.

Soeparno. 2009. Ilmu dan Teknologi Pengolahan Daging. Edisi ke-5. Gadjah Mada University Press. Yogyakarta.

Soeparno. 2011. Ilmu Nutrisi dan Gizi Daging. Cetakan ke-1. Gadjah Mada University Press. Yogyakarta.

Song, Z., L. Liu, A. Sheikhahmadi, H. Jiao, dan H. Lin. 2012. Effect of heat stress exposure on gene expression of feed intake regulatory peptides in laying hens. J. Biomed. Biotechnol. 8: 1-8

Soraya C., Sunnati, dan F. Wulandari. 2019. Efek antibakteri ekstrak daun mimba *(Azadirachta indica)* terhadap pertumbuhan *Enterococcus faecalis* secara *in vitro.* Cakradonya Dental Journal.11: 23-32.

UNIVERSITAS
GADJAH MADA
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Soumet, C., G. Ermel, N. Rose, V. Rose, P. Drouin, G. Salvat, dan P. Colin. 1999. Evaluation of a multiplex PCR assay for simultaneous identification of *Salmonella* sp., *Salmonella enteritidis*, and *Salmonella typhimurium* from environmental swabs of poultry houses. Lett. Appl. Microbiol. 28: 113-117.

Souza, J. R. R., J. P. A. Feitosa, N. M. P .S. Ricardo, M. T. S. Trevisan, H. C. B. De Paula, C. M. Ulrich, dan R. W. Owen. 2013. Spray-drying encapsulation of mangiferin using natural polymers. Food Hydrocoll. 33: 10-18.

Stadelman, W. J., V. M. Olson, G. A. Shmwell, dan S. Pasch. 1988. Egg and Poultry Meat Processing. Ellis Haewood Ltd.

Sudaryani, T. dan H. Santoso. 1994. Pembibitan ayam ras. Jakarta: Penebar Swadaya.

Sudharmono, U. 2014. Uji keamanan ekstrak etanol daun mindi (*Melia azedarach* L.) pada tikus galur wistar berdasarkan dosis letal 50 serta gambaran histopatologi hepar dan ginjal: 1-5.

Sugiharto, S. 2014. Role of nutraceuticals in guts health and growth performance of poultry. J. Saudi Soc. Agr. Sci: 1-12.

Sugito, W. Manalu, D. A. Astuti, E. Handharyani, dan Chairul. 2007. Morfometrik usus dan performan ayam broiler yang diberi cekaman panas dan ekstrak n-heksana kulit batang jaloh (*Salix tetrasperma* Rozb). Media Peternakan. 30: 198-206.

Sujatha, T., S. Abhinaya, J. Sunder, M. Thangapandian, dan A. Kundu. 2017. Efficacy of early chick nutrition with *Aloe vera* and *Azadirachta indica* on gut health and histomorphometry in chicks. Vet. World. 10: 569-573.

Sulistyoningsih, M. 2014. Optimalisasi produksi broiler melalui suplementasi herbal terhadap persentase karkas dan kadar trigliserida darah. Bioma. 3: 78-93.

Sun, X., A. Mc Elroy, Jr. Webb, A. E. K. E. Sefton, dan C. Novak. 2005. Broiler performance and intestinal alterations when fed drug-free diets. J. Poult. Sci. 84: 1294-1302.

Sundari, Zuprizal, dan R. Martien. 2014. The effect nanocapsule of turmeric extracts in rations on nutrient digestibility of broiler chickens. Anim. Prod. 16: 107-113.

Sundari. 2015. Pengaruh penambahan nanopartikel ekstrak kunyit sediaan serbuk dalam ransum terhadap kualitas fisik daging ayam broiler umur 5 minggu. Jurnal AgriSains. 6: 2541-5069

Susmitha, S., K. K. Vidyamol, P. Ranganayaki, dan R. Vijayaragavan. 2013. Phytochemical extraction and antimicrobial properties of *Azadirachta indica* (Neem). Glob. J. Pharmacol. 7: 316-320

Suwarda, R. dan M. S. Maarif. 2013. Pengembangan inovasi teknologi nanopartikel berbasis PAT untuk menciptakan produk yang berdaya saing. Jurnal Teknik Industri: 1411-6340.

Svihus, B. 2014. Function of the digestive system. J. Appl. Poult. Res. 23: 306-314.

UNIVERSITAS
GADJAH MADA
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Torres, R. L., A. Posadas-Cantu., R. Espilonosa-Leija., J. J. Hernandes-Escareno., H. Fimbres-Durazo., V. M. Riojas-Valdes., F. A. S. D. Estefano, dan F. J. Picon-Rubio. 2015. Effect of adding different levels of probiotics to broiler diets on gastrointestinal tract development and production performance. Afr J. Microbiol. Res. 9: 892-897.

Torok V. A., R. J. Hughes, K. Ophel-Keller, M. Ali, dan R. MacAlpine. 2009. Influence of different litter materials on cecal microbiota colonization in broiler chickens. Poult. Sci. 88: 2474-2481.

Trisna, A., Roeswandy, dan M. E. Hutasoit. 2008. Penggunaan tepung biji markisa terhadap pertumbuhan itik Peking umur 1-56 hari. Jurnal Agribisnis Peternakan. 4: 1-5.

Uni, Z. 1998. Impact of early nutrition on poultry: Review of presentations. J. Appl. Poult. Res. 7: 452-456.

Utami, M. M. D. dan D. Pantaya. 2016. Penggunaan ekstrak bawang putih dalam pakan terhadap performans ayam broiler tropis fase starter. Halaman 72-75 pada Seminar Nasional Hasil Penelitian dan Pengabdian Masyarakat. Jurusan Peternakan, Politeknik Negeri Jember. Jember.

Vidanarachchi, J. K., L. L. Mikkelsen, I. Sims, P. A. Iji, dan M. Choct. 2005. Phytobiotics: alternatives to antibiotic growth promoters in monogastric animal feed. Recent Adv. Anim. Nutr. Aust. 15: 131-144.

Vijayanand, S. dan E. G. Wesely. 2011. Phytochemical studies of *Melia azadirachta* & *Murraya koeingi*. Int. J. Pharm. Sci. Res. 2: 1298-1302.

Wahju, J. 2006. Ilmu Nutrisi Unggas. Edisi Kelima. Gadjah Mada University Press. Yogyakarta.

Walker, W. A. dan L. C. Duff. 1998. Diet and bacterial colonization: Role of probiotics and prebiotics. J. Nutr. Biochem. 9: 668-675.

Wang, M. Q., Z. R. Xu, L.Y. Zha, and M. D. Lindemann. 2007. Effects of chromium nanocomposite supplementation on blood metabolites, endocrine parameters and immune traits in finishing pigs. Anim. Feed Sci. Technol. 139: 69-80.

Wang, J. X. dan K. M. Peng. 2008. Developmental morphology of small intestine of African ostrich chicks. Poult. Sci. 87: 2629-2635.

Wenk, C. 2003. Herbs and botanicals as feed additives in monogastric animals. Asian-Australas. J. Anim. Sci. 16: 282-289.

Widodo, E. 2010. Nutrisi dan Teknik Pemeliharaan Ayam Organik. Universitas Brawijaya Press. Malang.

Wilson, K. J. dan R. S. Beyer. 2000. Poultry nutrition information for the small flock. Kansas State University Agricultural Experiment Station and Cooperative Extension Service. Kansas.

Windisch, W. dan A. Kroismayr. 2006. The effects of phytobiotics on performance and gut function in monogastrics. Pages 85-90 in Proceedings of the World nutrition forum: The future of animal nutrition. Biomin World Nutrition Forum.

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GADJAH MADA
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Windisch, W., K. Schedle, C. Plitzner, dan A. Kroismayr. 2007. Use of phytogenic products as feed additives for swine and poultry. J. Anim. Sci. 86: E140-E148.

Wismer, P. J. 1971. The Science of Meat and Meat Products. 2nd ed. Ed. J. F. Price, B. S. Schweigert, W. H. Freeman, dan C. S. Fransisco.

Wooley, R. E., P. S. Gibbs, T. P. Brown, J. J, dan Maurer. 2000. Chicken embryo lethality assay from determining of virulence of avian *Escherichia coli* isolated. Avian Dis. 44: 318-324.

Yang, Y., P. A. Iji, dan M. Choct. 2009. Dietary modulation of gut microflora in broiler chickens: A Review of the role of six kinds of alternatives to in-feed antibiotics. Worlds Poult. Sci. J. 65: 97-114.

Yashoda, K., N. Sachindra, P. Sakhare, dan D. N. Rao. 2001. Microbiological quality of broiler chicken carcasses processed hygienically in a small scale poultry processing unit. J. Food Qual. 24: 249-259.

Yao, Y., T. Xiaoyan, X. Haibo, K. Jincheng, X. Ming, dan W. Xiaobing. 2006. Effect of choice feeding on performance gastrointestinal development and feed utilization of broilers. Asian-Australas. J. Anim. Sci. 19: 91-96.

Yegani, M. dan D. R. Korver. 2008. Factors affecting intestinal health in poultry. Poult. Sci. 87: 2052-2063.

Yin, G. dan S. An-shan. 2004. Effects of different oligosaccharides on performance and availability of nutrients in broilers. J. Northeast Agric. Univ. 11: 37-41.

Yitnosumarto, S. 1993. Percobaab perancangan, analisis, dan interpretasinya. PT. Gramedia Pustaka Utama, Jakarta.

Yuanita, L., P. R. Wikandari, S. Poedjiastoeti, dan S. Tjahyani. 2009. Penggunaan natrium tripolifosfat untuk meningkatkan masa simpan daging ayam. AGRITECH. 29: 79-86.

Zanu, H. K., J. K. Kagya-Agyemang, W. K. J. Kwenin, F. R. K. Bonsu, E. Antwi dan S. Ateni. 2011. Physiological response of broiler chickens to neem (*Azadirachta indica*) and akakapenpen (*Rauvolfia vomitoria*) Decoctions: performance and carcass characteristics. Int. J. Poult. Sci. 10: 730-733

Zhang, W. F., D. F. Li.,W. Q. LU dan G. F. Yi. 2003. Effects of isomalto-oligosaccharides on broiler performance and intestinal microflora. Poult. Sci. 82: 657-663.