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DAFTAR PUSTAKA

Abbas, R.J. 2010. Effect of using fenugreek, parsley and sweet basil seeds as feed additives on the performances of broiler chickens. International Journal of Poultry Science. 9: 278-282.

Adibmoradi, M., B. Navidshad, J. Seifdavati, dan M. Royan. 2006. Effect of dietary garlic meal on histological structure of small intestine in broiler chickens. The Journal of Poultry Science. 43: 378-383.

Afrina, S. Chismirina, dan C.R.P. Aulia. 2016. Konsentrasi hambat dan bunuh maksimum ekstrak buah kapulaga (*Amomum compactum*) terhadap *Aggregatibacter actinomycetemcomitans.* Journal of Syiah Kuala Dentistry Society. 2: 192-200.

Agustina, L. 2006. Penggunaan ramuan herbal sebagai *feed additive* untuk meningkatkan performans broiler. Lokakarya Nasional Inovasi Teknologi dalam Mendukung Usaha Ternak Unggas Berdaya Saing. 40: 47-52.

Al-Kassie, G.A.M. 2008. The effect of anise and rosemary on broiler performance. International Journal of Poultry Science. 7: 243-245.

Al-Kassie, G.A.M. 2009. Influence of two plant extracts derived from thyme and cinnamon on broiler performance. Pakistan Veterinary Journal. 29: 169-173.

Alzawqari, M.H., A.A. Al-Baddany, H.H. Al-Baadani, I.A. Alhidary, R.U. Khan, G.M. Aqil, dan A. Abdurab. 2016. Effect o feeding dried sweet orange (*Citratus sinensis*) peel and lemon grass (*Cymbopogon citratus*) leaves on growth performance, carcass traits, serum metabolites and antioxidant status in broiler during the finisher phase. Environmental Science and Pollution Research. 23: 17077-17082.

Amrullah, I.K. 2004. Nutrien Ayam Broiler. Lembaga Satu Gunung Budi, Bogor.

Aneja, K.R. dan R. Joshi. 2009. Antimicrobial activity of *Amomum subulatum* and *Elettaria cardamomum* against dental caries causing microorganism. Ethnobotanical Leaflets. 13: 840-849.

Anita, V.P., K. Anam, dan D. Kusrini. 2013. Identifikasi kandungan kimia ekstrak etanol serai bumbu (*Andropogon citratus* D.C.) dan uji efektivitas repelen terhadap nyamuk *Aedes aegypti.* Jurnal Sains dan Matematika. 21: 20-24.

Apajalahti, J., A. Kettunen, dan H. Graham. 2004. Characteristic of gastrointestinal microbial communities with special reference to the chicken. World's Poultry Science Journal. 60: 223-232.

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Ariyanto, A.N., N. Iriyanti, dan M. Mufti. 2013. Pemanfaatan tepung kunyit (*Curcuma domestica* Val.) dan sambiloto (*Andrographis paniculate* Nees.) dalam pakan terhadap konsumsi pakan dan pertumbuhan bobot badan broiler. Jurnal Ilmiah Peternakan. 1: 471-478.

Ashayerizadeh, A., N. Dabiri, O. Ashayerizadeh, K. H. Mirzadeh, H. Roshanfekr, dan M. Mamooee. 2009. Effect of dietary antibiotic, probiotic, and prebiotic as growth promotores on growth performance, carcass characteristics and hematological indices of broiler chickens. Pakistan Journal of Biological Sciences. 12: 52-57.

Aulia, C.R.P. 2015. Efek antibakteri ekstrak buah kapulaga (*Amomum compactum*) terhadap pertumbuhan *Aggregatibacter actinomycetemcomitans* secara *in vitro.* Thesis. Fakultas Kedokteran Gigi, Universitas Syiah Kuala, Aceh.

Azevedo, I.L., E.R. Martins, A.C.D. Almeida, W. Carlos, L. Nogueira, D.E.D.F. Filho, V.K.F.D.R. Santos, dan L.J.C. Lara. 2017. Use of *Lippia rotundifolia* and *Cymbopogon flexuosus* essential oils, individually or in combination, in broiler diets. Brazilian Journal of Animal Science. 46: 13-19.

Bachiega, T.F. dan J.M. Sforcin. 2011. Lemongrass and citral effect on cytokines production by murine macrophages. Journal of Ethnopharmacology. 137: 909-913.

Backer, C.A., V. Bakhuzeizen, dan R.C. Brink. 1968. Flora of Java. P. Noordhof Groningen. Groningen.

Bailey, M. 1990. The water requirements of poultry. In: W. Heresign and D.J.A. Cole. Recent Advances in Animal Nutrition. Butterworths, London.

Bampidis, V.A., V. Christodoulou, P. Florou-Paneri, E. Christaki, P.S. Chatzopoulou, T. Tsiligianni, dan A.B. Spais. 2005. Effect of dietary dried oregano leaves on growth performance, carcass characteristics and serum cholesterol of female early maturing turkeys. British Poultry Science. 46: 595-601.

Barbosa, L.C., U.A. Pereira, A.P. Martinazzo, C.R. Maltha, R.R. Teixeira, dan E.C. Melo. 2008. Evaluation of the chemical composition of Brazilian commercial *Cymbopogon citratus* (D.C.) stapf samples. Molecules. 13: 1864-1874.

Bintang, I.A.K., A.P. Sinurat, dan T. Purwadaria. 2008. Penambahan antibiotika dan ampas mengkudu sebagai senyawa bioaktif terhadap performans ayam broiler. Jurnal Ilmu Ternak dan Veteriner. 13: 7-12.

Brenes, A. dan E. Roura. 2010. Essential oils in poultry nutrition: Main effects and modes of action. Animal Feed Science Technology. 158: 1–14.

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Budiarti, R., R. Djamil, S. Kumala. 2017. Parameter farmakologi dan uji aktivitas antibakteri dari ekstrak buah kapulaga (*Amomum cardamom* Wild.) terhadap bakteri *Streptococcus mutans*. Seminar Nasional. Fakultas Farmasi, Universitas Pancasila, Jakarta.

Cabuk, M., M. Bozkurt, A. Alcicek, Y. Akbas, dan K. Kucukyilmaz. 2006. Effect of a herbal essential oil mixture on growth and internal organ weight of broiler from young and old breeder flocks. South African Journal of Animal Science. 36: 135-141.

Casewell, M., C. Friis, E. Marco, P. McMullin, and I. Phillips. The European ban on growth-promoting antibiotics and emerging consequences for human and animal health. Journal of Antimicrobial Chemotherapy. 52: 159-161.

Castillo, M., S.M. Martin-Orue, M. Roca, E.G. Manzanilla, I. Badiola, J.F. Perez, dan J. Gasa. 2006. The response of gastrointestinal microbiota to avilamycin, butyrate, and plant extracts in early-weaned pigs. Journal of Animal Science. 84: 2725-2734.

Cho, J.H., H.J. Kim, dan I.H. Kim. 2014. Effects of phytogenic feed additive on growth performance, digestibility, blood metabolites, intestinal microbiota, meat color and relative organ weight after oral challenge with *Clostridium perfringens* in broilers. Livestock Science. 160: 82-88.

Choct, M. 2009. Managing gut health through nutrition. British Poultry Science. 50: 9-15.

Cross, D.E., R. McDevitt, K. Hillman, dan T. Acamovic. 2007. The effect of herbs and their associated essential oils on performance, dietary digestibility and gut microflora in chickens from 7 days to 28 days of age. British Poultry Science. 48: 33-35.

Cross, D.E., T. Acamovic, dan R.M. McDevitt. 2004. Effects of the inclusion of *Thymus vulgaris* oil in diets with and without enzymes, on nutrient digestibility in broilers. British Poultry Science. 45: 22-23.

Cushnie, T.P.T. dan A.J. Lamb. 2005a. Review: Antimicrobial activity of flavonoids. International Journal of Antimicrobial Agents. 26: 343-356.

Cushnie, T.P.T. dan A.J. Lamb. 2005b. Detection of galangin-induced cytoplasmic membrane damage in *Staphylococcus aureus* by measuring potassium loss. Journal of Ethnopharmacology. 101: 243-248.

Cushnie, T.P.T. dan A.J. Lamb. 2011. Recent advances in understanding the antibacterial properties of flavonoids. International Journal of Antimicrobial Agents. 38: 99-107.

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Dahal, I.M. dan M.T. Farran. 2011. Effect of dried medicinal crops on the performance and carcase flavour of broilers. International Journal of Poultry Science. 10: 152-156.

Danlami, U., A. Rebecca, D.B. Machan, dan T.S. Asuquo. 2011. Comparative study on the antimicrobial activities of the ethanolic extracts of lemon grass and *Polyalthia longifolia.* Journal of Applied Pharmaceutical Science. 1: 174-176.

Darwis, S.N., A.B.D.M. Indo, dan S. Hasiyah. 1991. Tanaman obat familia *Zingiberaceae*. Badan Penelitian dan Pengembangan Pertanian Industri. Bogor.

Daud, M., W.G. Piliang, dan I.P. Kompiang. 2007. Persentase dan kualitas karkas ayam pedaging yang diberi probiotik dan prebiotik dalam ransum. Jurnal Ilmu Ternak dan Veteriner. 12: 167-174.

Davey, P.G. 2000. Antimicrobial chemotherapy. In Concise Oxford Textbook of Medicine, eds. J.G.G. Ledingham and D.A. Warrel. Oxford University Press, Oxford.

Deplancke, B. dan H.R. Gaskins. 2001. Microbial modulation of innate defense: Goblet cells and the intestinal mucus layer. American Journal of Clinical Nutrition. 73: 1131-1141.

Dhama. K, S.K. Latheef, S. Mani, H.A. Samad, K. Karthik, R. Tiwari, R.U. Khan, M. Alagawany, M.R. Farag, G.M. Alam, V. Laudadio, V. Tufarelli. 2015. Multiple beneficial applications and modes of action of herbs in poultry health and production-A review. International Journal of Pharmacology. 11: 152-176.

Dibner, J.J. dan P. Buttin. 2002. Use of organic acids as a model to study the impact of gut microflora on nutrition and metabolism. The Journal of Applied Poultry Research. 11: 453-463.

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

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

Duncan, D.B. 1955. Multiple range and multiple *F* tests. International Biometric Society. 11: 1-42.

Effendy, M.A., O. Sjofjan, dan I.H. Djunaidi. 2015. Pengaruh penambahan tepung jintan hitam (*Nigella sativa)* dalam pakan terhadap aktifitas enzim protease, lipase dan amilase digesta itik hibrida. Skripsi. Fakultas Peternakan. Universitas Brawijaya, Malang.

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Elamin, R.F., K.A.A. Atti, dan B.M. Dousa. 2011. Response of broiler chicks to dietary cardamom (*Elettaria cardamomum*). University of Khartoum. Journal of Veterinary Medicine and Animal Production. 2: 33-48.

Engster, H.M., D. Marvil, B. Stewart-Brown. 2002. The effect of withdrawing growth promoting antibiotics from broiler chickens: A long term commercial industry study. Journal of Applied Poultry Research. 11: 431-436.

Eumkeb, G. dan S. Chukrathok. 2013. Synergistic activity and mechanism of action of ceftazidime and apigenin combination against ceftazidime-resistant *Enterobacte cloacae.* Phytomedicine. 20: 262-269.

Feng, Y.N., J. Gong, H. Yu, Y.P. Jin, J. Zhu, dan Y.M. Han. 2010. Identification of changes in the composition of ileal bacterial microbiota of broiler chickens infected with *Clostridium perfringens.* Veterinary Microbiology. 140: 116-121.

Fukunaga, T.M., Y. Sasaki, T. Araki, T. Okamoto, T. Yasuoka, Tsujikawa, Y. Fujiyama, dan T. Bamba. 2003. Effects of the soluble fibre pectin on intestinal cell proliferation, fecal short chain fatty acid production and microbial population. Digestion. 67: 42-49.

Ganiswara, G.S. 1995. Farmakologi dan Terapi, Ed. IV. Universitas Indonesia Press. Jakarta.

Grashorn, M.A. 2010. Use of phytobiotics in broiler nutrition - An alternative to infeed antibiotics. Journal of Animal and Feed Sciences. 19: 338-347.

Gurbuz, Y. dan I.A. Ismael. 2016. Effect of peppermint and basil as feed additive on broiler performance and carcass characteristics. Iranian Journal of Applied Animal Science. 6: 149-156.

Hamed, M.H. 2018. Response of broiler chicks fed on dietary of cardamom essential oils as natural growth promoter. Thesis. Department of Animal Production, Sudan University of Science and Technology, Sudan.

Harper, A.H., V.W. Rodwell, dan P.A. Mayer. 1980. Biokimia (Review of Physiological Chemistry). Alih Bahasa Martin Muliawan. Penerbit Buku Kedokteran E.G.C., Jakarta.

Herawati. 2008. Produksi karkas, hasil olahan dan perubahan histologi organ dan jaringan ayam broiler dengan suplemen fitobiotik jahe merah. Disertasi. Universitas Gadjah Mada, Yogyakarta.

Herawati. 2010. The effect of feeding red ginger as phytobiotic on body weight gain, feed conversion and internal organs condition of broiler. International Journal of Poultry Science. 9: 963-967.

UNIVERSITAS
GADJAH MADA
Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai dan Biji Kapulaga Melalui Air Minum
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Hintono, A., M. Astuti, H. Wuryastuti, dan E. S. Rahayu. 2007. Residu oksitetrasiklin dan aktivitas antibakterinya dalam telur dari ayam yang diberi oksitetrasiklin dengan dosis terapeutik lewat air minum. Journal of the Indonesian Tropical Animal Agriculture. 32: 64-70.

Hudiansyah, P., D. Sunarti, dan B. Sukamto. 2015. Pengaruh penggunaan kulit pisang terfermentasi dalam ransum terhadap ketersediaan energi ayam broiler. Agromedia. 33: 1-9.

Iji, P.A. 1999. The impact of cereal non-starch polysaccharides on intestinal development and function in broiler chickens. World's Poultry Science Journal. 55: 375-387.

Iji, P.A., A. Saki, dan D.R. Tivey. 2001. Body and intestinal growth of broiler chicks on a commercial starter diet. 1. Intestinal weight and mucosal development. British Poultry Science. 42: 505-513.

Iqbal, F., U. Atmomarsono, dan R. Muryani. 2012. Pengaruh berbagai frekuensi pemberian pakan dan pembatasan pakan terhadap efisiensi penggunaan protein ayam broiler. Animal Agricultural Journal. 1: 53-64.

Iskarlia, G.R., L. Rahmawati, dan U. Chasanah. 2014. Fungisida nabati dari tanaman serai wangi (*Cymbopogon nardus*) untuk menghambat pertumbuhan jamur pada batang karet (*Hevea brasillensis* Mueli, Arg). Jurnal Sains dan Terapan Politeknik Hasnur. 3: 1-9.

Jamal. A., K. Javed, M. Aslam, dan M.A. Jafri. 2006. Gastroprotective effect of cardamom, *Elettaria cardamom* Maton. fruits in rats. Journal of Ethnopharmacology. 106: 149-153.

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. Animal Feed Science and Technology. 134: 304-315.

Jeurissen, S.H., F. Lewis, J.D. van der Klis, Z. Mroz, J.M. Rebel, dan A.A. ter Huurne. 2002. Parameters and technique to determine intestinal health of poultry as constituted by immunity, integrity, and functionality. Current Issues in Intestinal Microbiology. 3: 1-14.

Jin, L.Z., Y.W. Ho, N. Abdullah, dan S. Jalaludin. 1998. Growth performance, intestinal microbial populations, and serum cholesterol of broilers fed diets containing *Lactobacillus* cultures. Poultry Science. 77: 1259-1265.

Kausar, R., F. Rizzi, dan A.D. Anjum. 1999. Effect of carminative mixture on health of broiler chicks. Pakistan Journal of Biological Sciences. 2: 1074-1077.

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

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Khodijah, E.S., Abun, dan R. Wiradimadja. Imbangan efisiensi protein broiler yang diberi ransum mengandung ekstrak kulit jengkol (*Pithecellobium jiringa* (*Jack*) *Prain*). Jurnal Universitas Padjajaran. 1: 1-6.

Kiha, A.F., W. Murningsih, dan Tristiarti. 2012. Pengaruh pemeraman ransum dengan sari daun papaya terhadap kecernaan lemak dan energi metabolis ayam broiler. Animal Agricultural Journal. 1: 265-276.

Korikontimath, V.S., R. Mulge, dan J.T. Zachariah. 1999. Variations in essential oil constituents in high yielding selections of cardamom. Journal of Plantation Crops. 27: 230-232.

Korzybski, T., Z. Kowszyk-Gindifer, dan W. Kurylowicz. 1967. Antibiotics: Origin, Nature and Properties. Vol II. Pergamon Press, Oxford, United Kingdom.

Krisnan, R. 2005. Pengaruh pemberian ampas teh (*Camellia sinensis*) fermentasi dengan *Aspergillus niger* pada ayam broiler. Jurnal Ilmu Ternak dan Veteriner. 10: 1-5.

Kumari P, M.K. Gupta, R. Ranjan, K.K. Singh, and R. Yadava. 2007. *Curcuma longa* as feed additive in broiler birds and its patho-physiological effects. Indian Journal of Experimental Biology. 45: 272-277.

Kurniatama, O. 2013. Pemanfaatan energi untuk pertumbuhan ayam broiler akibat pemberian tepung daun papaya dalam ransum. Skripsi. Fakultas Peternakan dan Pertanian, Universitas Diponegoro, Semarang.

Kusumasari, Y.F.Y., V.D. Yunianto, dan E. Suprijatna. 2012. Pemberian fitobiotik yang berasal dari mahkota dewa *(Phaleria macrocarpa)* terhadap kadar hemoglobin dan hematokrit pada ayam broiler. Jurnal Aplikasi Teknologi Pangan. 1: 129-132.

Lan, Y., M.W.A. Verstegen, S. Tamminga, dan B.A. Williams. 2005. The role of the commensal gut microbial community in broiler chickens. World's Poultry Science Journal. 61: 95-104.

Langhout D.J., J.B. Schutte, J. Jong, H. Sloetjes, W.A. Verstegen, dan S. Tamminga. 2000. Effect of viscosity on digestion of nutrients in conventional and germ-free chicks. British Journal of Nutrition. 83: 533-540

Latshaw, J.D. 2008. Daily energy intake of broiler chickens is altered by proximate nutrient content and form of the diet. Poultry Science. 87: 89-95.

UNIVERSITAS
GADJAH MADA
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Le Blay, G., H.M. Blottiere, L. Ferrier, E.C. Le Foll, J.P. Bonnet, Galmiche, dan C. Cherbut. 2000. Short-chain fatty acids induce cytoskeletal and extracellular protein modifications associated with modulation of proliferation on primary culture of rat intestinal smooth muscle cells. Digestive Disease Science. 45: 1623-1630.

Lee, M.H., H.J. Lee, dan P.D. Ryu. 2001. Public health risk chemical and antibiotics residues. Asian-Australasian Journal of Animal Sciences. 14: 297-306.

Leeson, S., J.D. Summers, dan L. Caston. 1993. Growth response of immature brown-egg strain pullet to varying nutrient density and lysine. Journal of Poultry Science. 72: 1349-1358.

Lijuan W, S. Kupittayariant, K. Yoohat, F. Kupittayanant, S. Chunlun, dan P. Papirom. 2007. Effect of fresh garlic supplements on serum cholesterol levels of broiler chickens. Planta Medica. 73: 919.

Loumouamou, A.N., Th. Silou, J.C. Chalchat dan G. Figuérédo. 2011. Chemical profile of essential oils from the leaves of *Eucalyptus nesophila* acclimatised in Congo-Brazzaville. Statistical approach. Asian Journal of Agriculture Sciences. 3: 80-86.

Mahfudz, L.D., T.A. Sarjana, dan W. Sarengat. 2010. Efisiensi penggunaan protein ransum yang mengandung limbah destilasi minuman beralkohol (LDMB) oleh burung puyuh (*Coturnix coturnix japonica*) jantan. Seminar Nasional Teknologi Peternakan dan Veteriner. 1: 887-894.

Manvitha, K. dan B. Bidya. 2014. Review on pharmacological activity of *Cymbopogon citratus.* International Journal of Herbal Medicine. 1: 5-7.

Marcin, A. dan P. Nad. 2017. Effect of essential oils on enzymatic activities in the intestinal apparatus and growth ability of laboratory mice. Physiological Research. 66: 567-574.

Martinez, W.S. 1999. Vertical coordination in the pork and broiler industries: implications for pork and chicken products. Agricultural Economic Report No 777. U.S. Department of Agriculture, Washington D.C.

Matasyoh, J.C., I.N. Wagara, J.L. Nakavuma, dan A.M. Kiburai. 2011. Chemical composition of *Cymbopogon citratus* essential oil and its effect on mycotoxigenic *Aspergillus* species. African Journal of Food Science. 5: 138-142.

Mathlouthi, N., T. Bouzaienne, I. Oueslati, F. Recoquillay, M. Hamdi, M. Urdaci, dan R. Bergaoui. Use of rosemary, oregano, and a commercial blend of essential oils in broiler chickens: *In vitro* antimicrobial activities and effects on growth performance. Journal of Animal Science. 90: 813-823.

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Melingasuk, M., S. Gibril, dan A.E.E. Ahmed. 2012. Effect of sorghum tannin on the performance of broiler chicks and their carcass characteristics. Journal of Agriculture Science. 3: 329-346.

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

Mmereole, F.U.C. 2010. Effects of lemon grass (*Cymbopogon citratus*) leaf meal feed supplement on growth performance of broiler chicks. International Journal of Poultry Science. 9: 1107-1111.

Mujab, S. 2017. Efisiensi penggunaan protein dan energi ayam pedaging yang mendapatkan pakan dengan suplementasi fitobiotik tepung rimpang temulawak dan jahe merah. Skripsi. Fakultas Peternakan, Universitas Gadjah Mada, Yogyakarta.

Mukhtar, A.M., K.A. Mohamed, O.A. Amal, dan A.H. Ahlam. 2012. Effect of different levels of lemon grass oil (LGO) as a natural growth promoter on the performance, carcass yields and serum chemistry of broiler chicks. Egypt Poultry Science. 33: 1-7.

Mulyono, R. Murwani, dan F. Wahyono. 2009. Kajian penggunaan probiotik *Saccharomyces cereviceae* sebagai alternatif aditif antibiotik terhadap kegunaan protein dan energi pada ayam broiler. Journal of the Indonesian Tropical Animal Agriculture. 34: 145-151.

Nahashon, S.N., N. Adefope, A. Amenyenu, dan D. Wright. 2005. Effects of dietary metabolizable energy and crude protein concentrations on growth performance and carcass characteristics of French guinea broilers. Journal of Poultry Science. 84: 337-344.

Nambiar, V.S., dan H. Matela. 2012. Potential functions of lemon grass (*Cymbopogon citratus*) in health and disease. International Journal of Pharmaceutical and Biological Archives. 3: 1035-1043.

Nanekarani, S., M. Goodarzi, M. Heidari, dan N. Landy. 2012. Efficiency of ethanolic extract of peppermint (*Mentha piperita*) as an antibiotic growth promoter substitution on performance, and carcass characteristics in broiler chickens. Asian Pacific Journal of Tropical Biomedicine. 12: 1611-1614.

Naveed, R., I. Hussain, M.S. Mahmood, dan M. Akhtar. 2013. *In vitro* and *in vivo* evaluation of antimicrobial activities of essential oils extracted from some indigenous spices. Pakistan Veterinary Journal. 33: 413-417.

Negrelle, R.R.B. dan E.C. Gomes. 2007. *Cymbopogon citratus* (DC) Stapf: Chemical Composition and Biological Activities. Revolution of Brasilian Plant Medical Botucatu. 9: 80-92.

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Niewold, T.A. 2007. The nonantibiotic anti-inflammatory effect of antimicrobial growth promoters, the real mode of action? A hypothesis. Poultry Science. 86: 605-609.

Ogbonna, C.G., A.O. Akintude, O.M. Dupe, A.O. Arinola, N.L. Chidinma, A.O. Emmanuel, A.A. Joshua, A.B. Taofeek, dan A.O. John. 2017b. Carcass and performance characteristics of broiler chickens fed with *Cymbopogon citratus* leaf meal as alternative to mycotoxin binder. International Journal of Agricultural Science Research. 6: 18-23.

Ogbonna, C.G., A.O. Akintude, T.O. Grace, A.O. Olufunso, A.J. Osagie, L.C. Ndubuisi-Ogbonna, dan O.C. Faith. 2017a. Serum biochemistry and sensory evaluation of broiler chicken fed *Cymbopogon citratus* leaf meal. World Journal of Agricultural Research. 5: 305-309.

Olorunnisola, S.K, H.T. Asiyanbi, A.M. Hammed, S. Simsek. 2014. Biological properties of lemongrass: An overview. International Food Research Journal. 21: 455-462.

Oloyede, I.O. 2009. Chemical profile and antimicrobial activity of *Cymbopogon citratus* leaves. Journal of Natural Products. 2: 98-103.

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. Journal of Animal Science. 92: 3945-3953.

Omidi, M., K. Taherpour, J. Cheraghi, dan H.A. Ghasemi. 2015. Influence of cardamom essential oils and seeds on growth performance, blood characteristic and immunity of broilers. Animal Production Science. 55: 573-579.

Onifade, A.A., A.A. Odunsi, G.M. Babatunde, B.R. Olorede, dan E. Muma. 1999. Comparison of the supplemental effects of *Saccharomyces cerevisiae* and antibiotics in low-protein and high-fibre diets fed to broiler chickens. Archive of Animal Nutrition. 52: 29-39.

Onu, P.N. dan A.O. Aniebo. 2011. Influence of *Moringa oleifera* leaf meal on the performance and blood chemistry of starter broilers. International Journal of Food, Agriculture and Veterinary Sciences. 1: 38-44.

Paolillo, R., C. R. Carratelli, dan A. Rizzo. 2011. Effect of resveratrol and quercetin in experimental infection by *Salmonella enterica* serovar *Typhimurium*. International Immunopharmacol. 2: 149-156.

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

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Pelicano, E.R.L., P.A. Souza, H.B.A. Souza, F.R. Leonelm, N.M.B.L. Zeola, dan M.M. Boiago. 2004. Productive traits of broiler chickens fed diets containing different growth promoters. Brazilian Journal of Poultry Science. 6: 177-182.

Pratikno, H. 2010. Pengaruh ekstrak kunyit (*Curcuma Domestica* Vahl.) terhadap bobot badan ayam broiler (*Gallus* sp.). Buletin Anatomi dan Fisiologi. 18: 39-46.

Pratikno, H. 2011. Lemak abdominal ayam broiler (*Gallus* sp.) karena pengaruh ekstrak kunyit (*Curcuma domestica* Vahl.). Berkala Ilmiah Biologi. 13: 1-9.

Pratiwi, S.I. 2008. Aktivitas antibakteri tepung daun jarak (*Jatropha curcas* L.) pada berbagai bakteri saluran pencernaan ayam broiler secara *in vitro*. Skripsi. Institut Pertanian Bogor, Bogor.

Pulido, R., L. Bravo, dan F. Saura-Calixto. 2000. Antioxidant activity of dietary polyphenols as determined by a modified ferric reducing/antioxidant power assay. Journal of Agriculture and Food Chemistry. 48: 3396-3402.

Quinche, A.R.S., S.D.A. Rivas, L.S.H. Flores, L.F.A. Galvez, O.N.V. Gonzalez, M.L.Z. Saavedra, dan A.E.G. Lopez. 2016. Effect of *Cymbopogon citratus* (DC.) stapf., *Plectra Thus Amboinicus* (Lour.), *Tilia cordata* (Mill.), *Lippia alba* (Mill.) and *Ocimun bacilicum* (L.), to control *Escherichia coli* in broiler chickens. American International Journal of Contemporary Research. 6: 158-165.

Rasyaf, M. 2002. Beternak Ayam Pedaging. Penebar Swadaya, Jakarta.

Rheza, M. 2015. Uji aktivitas antibakteri infusa daun mangga bacang (*Mangifera foetida* L.) terhadap pertumbuhan *Shigella flexneri*. Naskah Publikasi. Fakultas Kedokteran, Universitas Tanjungpura, Pontianak.

Rukmana. 1994. Kunyit. Penerbit Kanisius, Yogyakarta.

Rumokoy, L., C. Kaunang, dan W. Toar. 2017. Efek ekstrak minyak citronella *Cymbopogon nardus* L. terhadap proporsi frekuensi kontak fisik *Musca domestica* L. (Diptera: Muscidae) pada ransum dan performa ayam broiler. Indonesian Journal of Entomology. 14: 89-96.

Salam, S., A. Fatahilah, D. Sunarti, 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: 84-89.

Santoso, B.M. 2007. Sereh Wangi Bertanam dan Penyulingan. Penerbit Kanisius, Yogyakarta.

UNIVERSITAS
GADJAH MADA
Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai dan Biji Kapulaga Melalui Air Minum
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Sari, K.A., B. Sukamto, dan B. Dwiloka. 2014. Efisiensi penggunaan protein pada ayam broiler dengan pemberian pakan mengandung tepung daun kayambang (*Salvinia molesta*). Jurnal Agripet. 14: 76-83.

Sariozkan, S., Y. Konca, B.K. Guclu, E. Aktug, M. Kaliber, S. Ozkan, dan S. Tugrulay. 2016. The effect of dietary supplementation of lemon grass (*Cymbopogon citratus*) on performance, carcass quality, and marketing of quail (*Coturnix coturnix japonica*). Veterinary Medicine Journal. 62: 98-103.

Shah, G., R. Shri, V. Panchal, N. Sharma, B. Singh, dan A.S. Mann. 2011. Scientific basis for the therapeutic use of *Cymbopogon citratus*, stapf (Lemon grass). Journal of Advanced Pharmaceutical Technology and Research. 2: 3-8.

Shinde, S., R.G. Burte, S. Kumar, B.G. Desai, J.S. Dhekele, dan D.J. Bhagat. 2017. Efefct of cardamom (*Elettaria cardamomum*) and ginger (*Zingiber officinale*) powder supplementation on growth performance and economic analysis in broiler. International Journal of Chemical Studies. 5: 858-861.

Sidadolog, J.H.P. dan T. Yuwanta. 2009. Pengaruh konsentrasi protein-energi pakan terhadap pertambahan berat badan, efisiensi energi dan efisisiensi protein pada masa pertumbuhan ayam merawang. Animal Production. 11: 15-22.

Siddiqui, M. N. dan A. M. Sayed. 2015. Effects of dietary black seed (*Nigella sativa* L.) extract supplemented diet on growth performance, serum metabolites and carcass traits of commercial broiler. Journal of Animal Science Advances. 5: 1380-1385.

Sinaga, E. 2008. *Amomum cardamom* wild. Pusat Penelitian dan Pengembangan Tumbuhan Obat. Universitas Nasional, Jakarta.

Sinurat, A.P., T. Purwadaria, I.A.K. Bintang, P.P Ketaren, N. Bermawie, M. Raharjo, dan M. Rizal. 2009. Pemanfaatan kunyit dan temulawak sebagai imbuhan pakan ayam broiler. Jurnal Ilmu Ternak dan Veteriner. 14: 90-96.

Situmorang, N.A., L.D. Mahfudz, dan U. Atmomarsono. 2013. Pengaruh pemberian tepung rumput laut (*Gracilaria verrucosa*) dalam ransum terhadap efisiensi penggunaan protein ayam broiler. Animal Agricultural Journal. 2: 49-56.

Snel, J., H.J.M Harmsen, P.W.J.J. Van de Wielen, dan B.A. Williams. 2002. Dietary strategies to influence the gastrointestinal microflora of young animals, and its potential to improve intestinal health. In: M.C. Blok, H.A. Vahl, L. de Lange, A.E. Braak, G. Hemke, and M. Hessing. Editors. Nutrition and Health of Gastrointestinal Tract. Wageningen Academic Publishers. Wageningen, Netherlands. p. 37-69.

UNIVERSITAS
GADJAH MADA
Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai dan Biji Kapulaga Melalui Air Minum
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Solanki, R., V. Mathur, S.K. Purohit, dan M. Mathur. Evaluation of wound healing activity of ethanolic extract of *Ocimum basilicum* and *Aegle marmelos* leaves in male albino rats. International Journal of Drug Research and Technology. 2: 198-202.

Sonali, S., R.G. Burte, S. Kumar, B.G. Desai, J.S. Dhekale, dan D.J. Bhagat. 2017. Effect of cardamom (*Elettaria cardamom*) and ginger (*Zingiber officinale*) powder supplementation on growth performance and economic analysis in broiler. International Journal of Chemical Studies. 5: 858-861.

Sonali, S., R.G. Burte, S. Kumar, B.G. Desai, N.N. Prasade, J.S. Dhekale, dan D.J. Bhagat. 2016. Effect of ginger (*Zingiber officinale*) and cardamom (*Elettaria cardamom*) powder on physiological and heamto-biochemical parameters of broilers. Journal of Livestock Biodiversity. 6: 59-63.

Spellman, K., J. Burns, D. Nichols, N. Winters, S. Ottersberg, dan M. Tenborg. 2006. Modulation of cytokine expression by traditional medicines: A review of herbal immunomodulators. Alternative Medicine Review. 11: 128-150.

Srinisavan, K. 2005. Spices as influencers of body metabolism: An overview of three decades of research. Food Research International. 38: 77-86.

Subekti, S., W.G. Piliang, W. Manalu, dan T.B. Murdiati. 2006. Penggunaan tepung daun katuk dan ekstrak daun katuk (*Sauropus androgynus* L. Merr) sebagai subtitusi ransum yang dapat menghasilkan produk puyuh Jepang rendah kolesterol. Jurnal Ilmu Ternak dan Veteriner. 11: 254-259.

Sudrajat, D., D. Kardaya, B. Malik, dan Abas. 2015. Pengaruh larutan daun sirih dalam air minum sebagai pengganti antibiotik terhadap retensi nitrogen dan energi metabolis ransum. Jurnal Peternakan Nusantara. 1: 33-38

Sukamto, B. 2013. Kebutuhan Energi dan Protein Pakan Unggas. Undip Press, Semarang.

Tantalo, S. 2009. Perbandingan performans dua *strain* broiler yang mengonsumsi air kunyit. Jurnal Ilmiah Ilmu-Ilmu Peternakan. 12: 146-152.

Thayalini, K., S. Shanmugavelu, P.M. Saminathan, M.S.S. Masidayu, Y.N. Idayusni, H. Zainuddin, C.A.N. Akmal, dan H.K. Wong. 2011. Effect of *Cymbopogon citratus* leaf and *Zingiber officinale* rhizome supplementation on growth performance, ileal morphology and lactic acid concentration in broilers. Malaysian Journal of Animal Science. 14: 43-49.

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Tillman, A.D., H. Hartadi, S. Reksohadiprojo, S. Prawirokusumo, dan S. Lebdosoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.

Turner, I.M. 2011. The contribution of Jonathan Pereira (1804-1853) to plant taxonomy. Kew Bulletin. 66: 581-585.

Ueda, H., S. Matsumoto, dan K. Tanoue. 2004. Growth response and crop emptying in chicks force-fed diets containing various saponins. Journal of Poultry Science. 41: 298-306.

Ulanowska, K., A. Tkaczyk, G. Konopa, G. Wegrzyn. 2006. Differential antibacterial activity of genistein arising from global inhibition of DNA, RNA and protein synthesis in some bacterial strains. Archives of Microbiology. 184: 271-278.

Utami, D.R. 2013. Aktivitas antibakteri ekstrak buah kapulaga (*Amomum compactum* Soland. ex Maton.) terhadap *Escherichia coli* dan *Streptococcus pyogenes*. Skripsi. Fakultas Teknobiologi, Universitas Atmajaya, Yogyakarta.

Varel, V.H. 2002. Livestock manure odor abatement with plant-derived oils and nitrogen conservation with urease inhibitors: A review. Journal of Animal Science. 80: 1-7.

Vidanarachchi, J.K., A.V. Elangovan, L.L. Mikkelsen, M. Choct, dan P.A. Iji. 2010. Effect of some plant extracts on growth performance, intestinal morphology, microflora composition and activity in broiler chickens. Animal Production Science. 50: 880-889.

Wahyu, J. 1992. Ilmu Nutrisi Unggas. Gadjah Mada University Press, Yogyakarta.

Wang, R., D. Li, dan S. Bourne. 1998. Can 2000 years of herbal medicine history help us solve problems in the year 2000? Biotechnology in the feed industry: Proceedings of Alltech's 14th Annual Symposium, Kentucky, USA. 273-291.

Wannissorn, B., S. Jarikasem, T. Siriwangchai, dan S. Thubthimthed. 2005. Antibacterial properties of essential oils from Thailand medicinal plants. Fitoterapia. 76: 233–236.

Weiss, E.A. 2002. Spice Crops. CABI Publishing. Wallingford, UK. 299.

Widiastuti, R. 2008. Residu enrofloksasin dan siprofloksasin pada ayam pedaging pasca pencekokan enrofloksasin. Jurnal Ilmu Ternak dan Veteriner. 13: 150-154.

Widodo, W. 2005. Tanaman Beracun dalam Kehidupan Ternak. UMM Press. Universitas Muhammadiyah Malang, Malang.

UNIVERSITAS
GADJAH MADA
**Efisiensi Protein Energi Ayam Broiler yang Mendapatkan Pakan dengan Penambahan Ekstrak Daun Serai
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Wina, E., T. Pasaribu, S.I.W. Rakhmani, dan B. Tangendjaja. 2017. The role of saponin as feed additive for sustainable poultry production. Wartazoa. 3: 117-124.

Windisch, W., K. Schedle, C. Plitzner, dan A. Kroismayr. 2008. Use of phytogenic products as feed additives for swine and poultry. Journal of Animal Science. 86: 140-148.

Xie, Y., W. Yang, F. Tang, X. Chen, dan L. Ren. 2015. Antibacterial activities of flavonoids: Structure activity relationship and mechanism. Current Medicinal Chemistry. 22: 132-149.

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. World's Poultry Science Journal. 65: 97-114.

Yazdi, F.F., G. Ghalamkari, M. Toghiani, M. Modaresi, dan N. Landy. 2014. Anise seed (*Pimpinella anisum* L.) as an alternative to antibiotic growth promoters on performance, carcass traits and immune responses in broiler chick. Asian Pasific Journal of Tropical Disease. 4: 447-451.

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

Yuningsih, T.B. Murdiati, dan S. Juariah. 2005. Keberadaan residu antibiotika tilosin (golongan makrolida) dalam daging ayam asal daerah Sukabumi, Bogor dan Tangerang. Seminar Nasional Teknologi Peternakan dan Veteriner. 921-925.

Zomrawi, W.B., K.A.A. Abdel Atti, B.M. Dousa, dan A.G. Mahala. 2013. The effect of dietary ginger root powder *(Zingiber officinale)* on broiler chicks performance, carcass characteristic and serum constituents. Journal of Animal Science Advances. 3: 42-47.

Zulkarnain, D. 2008. Pengaruh suplementasi tepung kunyit *(Curcuma domestica* Val.*)* sebagai bahan antioksidan dalam ransum terhadap performan ayam broiler. Agriplus. 3: 235-243.