UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Abbas, S., M. Bashari, W. Akhtar, W. W. Li, and X. Zhang. 2014. Process optimization of ultrasound assisted curcumin nanoemulsions stabilized by OSA modified starch. Ultrasonics Sonochemistry. 21: 1265-1274.

Abdelli, N. D., S. Oriol, and J. F. Pérez. 2021. Phytogenic feed additives in poultry: achievements, prospective, and challenges. Animals. 11: 1-26.

Abdelnour, S., M. Alagawany, M. E. A. Hack, A. M. Sheiha, I. M. Saadeldin, and A. A. Swelum. 2018. Growth, carcass traits, blood hematology, serum metabolites, immunity, and oxidative indices of growing rabbits fed diets supplemented with red or black pepper oils. Animals. 8: 1-14.

Abdelwahab, S. I., S. Mohan, M. A. Abdullah, M. A. Sukari, A. B. Abdul, M. M. E. Taha, S. Syam, S. Ahmad, and K. H. Lee. 2011. The methanolic extract of *Boesenbergia rotunda* (L.) Mansf. and its major compound pinostrobin induces anti ulcerogenic property *in vivo*: possible involvement of indirect antioxidant action. Journal of Ethnopharmacology. 137: 963-970.

Abdullah, B., E. Kusumanti, dan U. Atmomarsono. 2015. Pengaruh penambahan tepung temu kunci (*Boesenbergia pandurata* Roxb.) dalam ransum terhadap bobot hidup, kadar SGOT, SGPT, dan kondisi hati ayam broiler. Animal Agriculture Journal. 4: 41-46.

Adaszynska, S. M. and D. Szczerbinska. 2017. Use of essential oils in broiler chicken production – a review. Annals of Animal Science. 17: 317-335.

Adewole, F. A., L. T. Egbeyale, D. A. Ekunseitan, K. O. Bello, O. A. Lala, and S. A. Famakin. 2021. Effect of strain and sex on haematological and serum biochemical indices of tropical indigenous chickens. Nigerian Journal of Animal Production. 48: 18-26.

Adikara, W. dan I. W. Sudira. 2013. Studi histopatologi hati tikus putih (*Rattus Norvegicus*) yang diberi ekstrak etanol daun kedondong (*Spondias dulcis* G.) secara oral. Buletin Veteriner Udayana. 5: 107-113.

Aghwan, Z. A., A. R. Alimon, Y. M. Goh, K. Nakyinsige, and A. Q. Sazili. 2014. Fatty acid profiles of supraspinatus, longissimus lumborum, and semi tendinosus muscles and serum in kacang goats supplemented with inorganic selenium and iodine. Asian Australian Journal of Animal Sciences. 27: 543-550.

Ahmad, N., H. Fazal, B. H. Abbasi, S. Farooq, M. Ali, and M. A. Khan. 2012. Biological role of *Piper nigrum L*. (Black pepper): A review. Asian Pacific Journal Tropical Biomedicine. 2: 1945-1953.

Ahmadi, F. and F. Rahimi. 2011. Factors affecting quality and quantity of egg production in laying hens: a review. World Applied Sciences Journal. 12: 372-384.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Aiswarya, S. 2015. Therapeutic effects of *Bossenbergia rotunda*. International Journal of Science and Research. 6: 1323-1327.

Akbar, N. D., A. K. Nugroho, and S. Martono. 2022. Review article: Optimization of SNEDDS formulation by simplex lattice design and box behnken design. Jurnal Ilmiah Farmako Bahari. 13: 90-100.

Akbarian, A., A. Golian, A. S. Ahmadi, and H. Moraveij. 2011. Effects of ginger root (*Zingiber officinale*) on egg yolk cholesterol, antioxidant status, and performance of laying hens. Journal of Applied Animal Research. 1: 19-21.

Aksu, T. and A. S. Bozkurt. 2009. Effect of dietary essential oils and humic acids on broiler performance, microbial population of intestinal content and antibody titres in the summer season. Kafkas Universitesi Veteriner Fakultesi Dergisi. 15: 185 -190.

Alagawany, M., M. M adkour, M. T. E. Saadony, and F. M. Reda. 2021. *Paenibacillus polymyxa* (LM31) as a new feed additive: Antioxidant and antimicrobial activity and its effects on growth, blood biochemistry, and intestinal bacterial populations of growing Japanese quail. Animal Feed Science ansd Technology. 276: 1-13.

Alcicek, A., M. Bozkurt, and M. Cabuk. 2003. The effect of an essential oil combination derived from selected herbs growing wild in Turkey on broiler performance. South African Journal of Animal Science. 33: 1-2.

Aligiannis, N., E. Kalpoutzakis, S. Mitaku, and I. B. Chinou. 2001. Composition and antimicrobial activity of the essential oil of two origanum species. Journal of Agricultural and Food Chemistry. 49: 4168-4170.

Almajano, R. C., M. E. Delgado, and M. H. Gordon. 2007. Effect of pH on the antimicrobial activity and oxidative stability of oil in water emulsions containing caffeic acid. Journal of Food Science. 72: 258-263.

Amrutkar, C., K. Salunkhe, and S. Chaudhari. 2014. Study on self nano emulsifying drug delivery system of poorly water soluble drug rosuvastatin calcium. World Journal of Pharmaceutical Research. 3: 2137-2151.

An, S. Y., M. Guo, S. D. Ma, J. M. Yuan, and G. Z. Liu. 2010. Effects of different oil sources and vitamin E in breeder diet on egg quality, hatchability, and development of the neonatal off spring. Asian Australasian Journal of Animal Sciences. 23: 234-239.

Anggraini, R. and Nasronudin. 2013. Analysis on whole blood, SGOT, SGPT, and tnf A examination in patients with non dengue and positive dengue fever (df/dhf). Indonesian Journal of Tropical and Infectious Disease. 4: 46-52.

Anindhita, M. A. dan Nila, O. 2016. Formulasi *self nanoemulsifying drug delivery system* (SNEDDS) ekstak daun pepaya (*Carica papaya* L.) dengan *virgin coconut oil* (VCO) sebagai minyak pembawa. Jurnal Pena Medika. 6: 103-111.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Anonimous. 2017. Peraturan Menteri Pertanian Republik Indonesia Nomor 14/Permentan/PK.350/5/2017 tentang Klasifikasi Obat Hewan. Kementerian Kesehatan. Jakarta.

Apriliyani, F., N. Suthama, and H. I. Wahyuni, 2013. Heterophile lymphocyte ratio and burca fabricius relative weights as affected by different lighting duration and feeding portion in broiler chickens. Animal Agriculture Journal. 2: 393-399.

Arif, W. 2018. Uji efek antibakteri minyak atsiri rimpang temu kunci (*Boesenbergia pandurata*) terhadap pertumbuhan bakteri *Staphylococcus epidermidis* dan *Serratia marcescens* secara *in vitro*. Skripsi. Universitas Muhamadiyah Surakarta, Surakarta.

Arniputri, R. B., A. T. Satya, and M. Rahayu. 2007. Identifikasi komponen utama minyak atsiri temu kunci (*Kaemferia pandurata* Roxb.) pada ketinggian tempat yang berbeda. Biodiversitas. 8: 135-137.

Aruoma, O. 1998. Free radicals, oxidative stress, and antioxidants in human health and disease. Journal of the American Oil Chemists Society. 75: 199 - 212.

Asli, M., M. Shivazad, M. Zaghari, M. Rezaian, S. Aminzadeh, and G. G. Mateos. 2012. Effects of feeding regimen, fiber inclusion, and crude protein content of the diet on performance and egg quality and hatchability of eggs of broiler breeder hens. Poultry Science. 91: 3097-3106.

Association of Analytical Chemist Publisher (AOAC). 1995. Official Methods of Analysis. AOAC Publisher, Washington D.C.

Astuti, M. 1981. Rancangan Percobaan dan Analisa Statistik. Fakultas Peternakan, Universitas Gadjah Mada, Yogyakarta.

Atun, S. dan S. Handayani. 2017. Fitokimia tumbuhan temu kunci (*Boesenbergia rotunda*): Isolasi, identifikasi sruktur, aktivitas biologi, dan sintesis produk nanopartikelnya. K-Media Press, Yogyakarta.

Awang, D. V. C. 2000. The neglected ginsenosides of north american ginseng (*Panax quinquefolius* L.). Journal of Herbs, Spices, and Medicinal Plants. 7: 103-109.

Aygun, A. and R. Yetisir, 2010: The relationship among egg quality characteristic of different hybrid layers to forced molting programs with and without feed withdrawal. Journal of Animal and Veterinary Advances. 9: 710-715.

Badaruddin, R., R. Aka, A. R. Ollong, and N. A. D. Tiya. 2021. Uric acid, cholesterol, and blood glucose levels in layer hens with different levels of betel leaf juice. Journal of Tropical Animal and Veterinary Science. 11: 75-80.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Badran, M. M., E. I. Taha, M. M. Tayel, and S. A. A. Suwayeh. 2014. Ultra fine self nanoemulsifying drug delivery system for transdermal delivery of meloxicam: dependency on the type of surfactants. Journal of Molecular Liquids. 190: 16-22.

Badrussalam, A., Isroli, dan T. Yudiarti. 2020. Pengaruh penggunaan aditif kunyit terhadap bobot relatif organ pencernaan ayam kampung super. Jurnal Sain Peternakan Indonesia. 15: 273-279.

Baharudin, M., S. A. Hamid, and D. Susanti. 2015. Chemical composition and antibacterial activity of essential oils from three aromatic plants of the zingiberaceae family in Malaysia. Journal of Physical Science. 26: 71-81.

Bai, S. P., A. M. Wu, X. M. Ding, Y. Lei, J. Bai, K. Y. Zhang, and J. S. Chio. 2013. Effects of probiotic supplemented diets on growth performance and intestinal immune characteristics of broiler chickens. Poultry Science. 92: 663-670.

Bali, V., M. Ali, and J. Ali. 2011. Nanocarrier for the enhanced bioavailability of a cardiovascular agent: *In vitro*, pharmacodynamic, pharmacokinetic, and stability assessment. International Journal of Pharmaceutics. 403: 46-56.

Bandyopadhyay, S., O. P. Katare, and B. Singh. 2012. Optimized self nano-emulsifying systems of ezetimibe with enhanced bioavailability potential using long chain and medium chain triglycerides. Colloids and Surfaces Biointerfaces. 100: 50-61.

Barros, A. S., J. L. Duarte, H. Carvalho, and A. Maciel. 2020. The effects of *Rosmarinus officinalis* L. essential oil and its nanoemulsion on dyslipidemic Wistar rats. Journal of Applied Biomedicine. 16: 1-11.

Barton, M. D. 2000. Antibiotic use in animal feed and its impact on human health. Nutrition Research Reviews. 13: 279-299.Bartov, I. 1992. Effects of energy concentration and duration of feeding on the respon of broiler chicks to growth promotors. British Poultry Science. 33: 1057-1068.

Basalious, E. B., N. Shawky, and M. B. Eldin. 2010. SNEDDS containing bioenhancers for improvement of dissolution and oral absorption of Lacidipine. I: Development and optimization. International Journal of Pharmaceutics. 391: 203-211.

Baskara, A. 2017. Efek antimikrobia dan imunomodulator nano partikel minyak atsiri kayu manis (*Cinnamomum burmannii*) yang diberikan pada ayam broiler melalui air minum. Disertasi. Fakultas Peternakan, Universitas Gadjah Mada, Yogyakarta.

Basmacioglu, H. and M. Ergul. 2005. Research on the factor affecting cholesterol content and some other characteristics of eggs in laying hens. Turkish Journal of Veterinary and Animal Sciences. 29: 157-164.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Bassi, J. L., J. C. Panisson, C. M. M. Souza, V. G. Schraam, P. M. N. Floriano, E. M. C. Lima, and A. Maiorka. 2018. Inclusion of a commercial phytogenic feed additive on breeders egg quality parameters poultry science. Poultry Science Association 2nd Latin American Scientific Conference. Editors: Taylor. Hal. 1-7.

Batista, N. R., E. R. M. Garcia, C. A. L. Oliveira, N. N. Arguelo, and K. M. R. Souza. 2017. Trace mineral sources and rosemary oil in the diet of brown laying hens: Egg quality and lipid stability. Revista Brasileira de Ciencia Avicola. 19: 663–672.

Beandrade, M. 2018. Formulasi dan karakterisasi SNEDDS ekstrak jinten hitam (*Nigella sativa*) dengan fase minyak ikan hiu cucut botol (*Centrophorus sp*.) serta uji aktivitas imunostimulan. Journal of Pharmaceutical Science and Clinical Research. 3: 50 - 61.

Bedanova, I., E. Voslarova, P. Chloupek, V. Pistekova, P. Suchy, J. Blahova, R. Dobsikova, and V. Vecerek. 2007. Stress in broilers resulting from shackling. Poultry Science. 86: 1065-1069.

Boonme, P. and V. B. Junyaprasert. 2014. Development of SEDDS/SMEDDS of sweet basil oil and fingerroot oil for using in drinking water for chickens. The Thai Journal of Veterinary Medicine. 44: 297-305.

Borai, E. H., M. G. Hamed, A. M. E. Kamash, and M. M. A. Aly. 2018. Sonochemical synthesis and characterization of emulsion polymer for sorption of lanthanides. Journal of Molecular Liquids. 255: 556-561.

Botsoglou, N. A., P. F. Paneri, E. Christaki, D. J. Fletouris, and A. B. Spais. 2005. Effect of dietary oregano essential oil on performance of chickens and on iron induced lipid oxidation of breast, thigh, and abdominal fat tissues. British Poultry Science. 43: 223–230

Brenes, A., R. R. Marquardt, W. Guenter, and A. Viveros. 2002. Effect of enzyme addition on the performance and gastrointestinal tract size of chicks fed lupin seed and their fractions. Poultry Science. 81: 670-678.

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

Bridson, E. Y. 2006. Culture Media, The OXOID Manual, 9th ed. Unipath Ltd., Hampshire.

Brisbin, J. T., J. Gong, P. Parvizi, and S. Sharif. 2010. Effects of Lactobacilli on cytokine expression by chicken spleen and cecal tonsil cells. Clinical and Vaccine Immunology. 17: 1337-1343.

Broom, L. J. and M. H. Kogut. 2018. Inflammation: Friend or foe for animal production ? Poultry. Science. 97: 510-514.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Buenrostro, J. L. and F. H. Kratzer. 1989. Metabolism and nutrition effect of Lactobacillus inoculation and antibiotic feeding of chickens on availability of dietary biotin. Poultry Science. 22. 2022-2029.

Burdock, G. A. and I. G. Carabin. 2007. Safety assessment of myristic acid as a food ingredient. Food and Chemical Toxicology. 45: 517-529.

Burke, R. W., B. I. Diamondstone, R. A. Velapoldi, and O. Menis. 1974. Mechanisms of the Liebermann-Burchard and Zak color reactions for cholesterol. Clinical Chemistry. 20: 794-801.

Burt, S. 2004. Essential oils: Their antibacterial properties and potential applications in foods a review. International Journal of Food Microbiology. 94: 223-253.

Cabuk, M., M. Bozkurt, A. Alcicek, Y. Akbas, and K. Kucukyilmaz. 2006. Effect of a herbal essential oil mixture on growth and internal organ weight of broilers from young and old breeder flocks. South African Journal of Animal Science. 36: 1-2.

Calo, J. R., P. G. Crandall, C. A. O. Bryan, and S. C. Ricke. 2015. Essential oils as antimicrobials in food systems a review. Food Control. 54: 111-119.

Campbell, T. W. 2015. Exotic Animal Hematology and Cytology, 4th ed. John Wiley and Sons, New Jersey.

Carding, S. R., N. Davis, and L. Hoyles. 2017. Review article: The human intestinal virome in health and disease. Alimentary Pharmacology Therapeutics. 46: 800-815.

Carnesecchi, S., Y. Schneider, J. Ceraline, J. Duranton, B. Gosse, F. Seiler, and N. F. Raul. 2001. Geraniol, a component of plant essential oils, inhibits growth, and polyamine biosynthesis in human colon cancer cells. The Journal of Pharmacology and Experimental Therapeutics. 298:197–200.

Carson, C. F., B. J. Mee, and T. V. Riley. 2002. Mechanism of action of *Melaleuca alternifolia* (tea tree) oil on *Staphylococcus aureus* determined by time kill, lysis, leakage, and salt tolerance assays and electron microscopy. Antimicrobial Agents and Chemotheraphy. 46: 1914-1920.

Celi, P., A. J. Cowieson, A. J. F. Nji, F. Steinert, R. E. Kluenter, and A. M. Verlhac. 2017. Gastrointestinal functionality in animal nutrition and health: New opportunities for sustainable animal production. Animal Feed Science Technology. 234: 88-100.

Chahyadi, A., R. Hartati, K. R. Wirasutisna, and Elfahmi. 2014. *Boesenbergia pandurata* Roxb., an Indonesian medicinal plant: Phytochemistry, biological activity, plant biotechnology. Procedia Chemistry. 13: 13-37.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Chand, N., S. Naz, Z. Rehman, and R. U. Khan. 2018. Blood biochemical profile of four fast growing broiler strains under high ambient temperature. Applied Biological Chemistry. 61: 273-279.

Chellapa, P., A. T. Mohamed, E. I. Keleb, A. Elmahgoubi, A. M. Eid, Y. S. Issa, and N. A. Elmarzugi. 2015. Nanoemulsion and nanoemulgel as a topical formulation. IOSR Journal of Pharmacy. 5: 43-47.

Chen, W. and A. M. Viljoen. 2010. Geraniol - A review of a commercially important fragrance material. South African Journal of Botany. 76: 643-651.

Chen, J., C. Tang, R. Zhang, S. Ye, Z. Zhao, Y. Huang, X. Xu, W. Lan, and D. Yang. 2020. Metabolomics analysis to evaluate the antibacterial activity of the essential oil from the leaves of *Cinnamomum camphora* (Linn.) Presl. Journal of Ethnopharmacology. 253: 1-10.

Choct, M. 2015. Managing gut health through nutrition. British Poultry Science. 1: 1-7.

Chong, T., L. Y. Kee, C. C. Fei, H. C. Han, W. S. Ming, C. T. Ping, F. G. Teck, N. Khalid, N. A. Rahman, S. A. Karsani, S. Othman, R. Othman, and R. Yusof. 2012. *Boesenbergia rotunda*: From ethnomedicine to drug discovery. Evidence Based Complementary and Alternative Medicine. 2012: 1-26.

Chopra, I. and M. Roberts. 2001. Tetracycline antibiotics: Mode of action, applications, molecular biology, and epidemiology of bacterial resistance. Microbiology and Molecular Biology Reviews. 65: 232-260.

Chousalkar, K. K., S. Khan, and A. R. McWhorter. 2021. Microbial quality, safety, and storage of eggs. Current Opinion in Food Science. 38. 91-95.

Christie, W. 1992. Preparation of fatty acid methyl esters. Inform. 3: 1031– 1034.

Cimrin. 2019. Effect of cinnamaldehyde and 1,8-sineole on performance, egg quality, and some blood parameters of laying hens. Indian Journal of Animal Sciences. 89: 435-441

Cimrin, T., R. I. Tunca, M. D. Avsaroglu, T. Ayasan, and S. Kucukersan. 2020. Effects of an antibiotic and two phytogenic substances (Cinnamaldehyde and 1,8 sineol) on yolk fatty acid profile and storage period associated egg lipid peroxidation level. Revista Brasileira de Zootecnia. 49: 1-10.

Clench, M. H. and J. R. Mathias. 1995. The avian cecum: A review. Wilson Bull. 107: 93-121.

Cooper, K. K., J. R. Theoret, B. A. Stewart, H. T. Trinh, R. D. Glock, and J. G. Songer. 2010. Virulence for chickens of *Clostridium perfringens* isolated from poultry and other sources. Anaerobe. 16: 289–292.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Crowell, P. L. 1999. Symposium on phytochemicals: Biochemistry and physiology prevention and therapy of cancer by dietary monoterpenes. Journal of Nutrition. 129: 775-778.

Cullen, M. P., O. G. Rasmussen, and O. H. M. Wilder. 1962. Metabolizable energy value and utilization of different types and grades of fat by the chick. Poultry Science. 41: 360-367.

Dacosta, M., S. K. Sudirga, dan I. K. Muksin. 2017. Perbandingan kandungan minyak atsiri tanaman sereh wangi (*Cymbopogon nardus* L.) yang ditanam di lokasi berbeda. Jurnal simbiosis. 1: 25-31.

Darmawan, A., E. Ozturk, E. Gungor, S. Ozlu, and A. Jayanegara. 2024. Effects of essential oils on egg production and feed efficiency as influenced by laying hen breed: A meta-analysis. Veterinary World. 17: 197-206.

Datta, F. U., A. N. Daki, I. Benu, A. I. R. Detha, N. D. F. Foeh, dan N. A. Ndaong. 2019. Uji aktivitas antimikroba bakteri asam laktat cairan rumen terhadap pertumbuhan *Salmonella enteritidis*, *Bacillus cereus*, *Escherichia coli,* dan *Staphylococcus aureus* menggunakan metode difusi sumur agar: Konektivitas kesehatan hewan dan manusia di ekologi lahan kering kepulauan. Prosiding Seminar Nasional VII, 66-85. Fakultas Kedokteran Hewan, Universitas Nusa Cendana, Kupang.

Davis, W. and T. R. Stout. 1971. Disc plate method of microbiological antibiotic assay. Applied Microbiology. 22: 659-665.

Deans, S. G. and G. Ritchie. 1987. Antibacterial properties of plant essential oils. International Journal of Food Microbiology. 5: 165-180.

Dempsey, E. and S. C. Corr. 2022. *Lactobacillus sp*. for gastrointestinal health: current and future perspectives. Frontiers in Immunology. 13: 1-15.

Dewi, F. K. 2010. Aktivitas antibakteri ekstrak etanol buah mengkudu (*Morinda citrifolia* L.) terhadap bakteri pembusuk daging segar. Skripsi. Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Surakarta, Surakarta.

Dhillon, A. S., P. Roy, L. Lauerman, D. Schaberg, S. Weber, D. Bandli, and F. Wier. 2004. High mortality in egg layers as a result of necrotic enteritis. Journal of Avian Diseases. 48: 675-680.

Dilawar, M. A., H. S. Mun, D. Rathnayake, E. J. Yang, Y. S. Seo, H. S. Park, and C. J. Yang. 2021. Egg quality parameters, production performance, and immunity of laying hens supplemented with plant extracts. Animals. 11: 1-13.

Ding, X., Y. Yu, Z. Su, and K. Zhang. 2017. Effects of essential oils on performance, egg quality, nutrient digestibility, and yolk fatty acid profile in laying hens. Journal of Applied Animal Nutrition. 3: 127-131.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

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

Duke, J. A., M. J. B. Godwin, J. Cellier, and P. A. K. Duke. 2012. Handbook of Medicinal Herbs, 2nd ed. CRC Press, New York.

Duncan, R. E., D. Lau, A. E. Sohemy, and M. C. Archer. 2004. Geraniol and β-ionone inhibit proliferation, cell cycleprogression, and cyclin dependent kinase 2 activity in MCF-7 breast cancer cells independent of effects on HMG-CoA reductase activity. Biochemical Pharmacology. 68: 1739–1747.

El, G., H. H. A. El-Baky, R. S. Farag, and M. A. Saleh. 2010. Characterization of antioxidant and antimicrobial compounds of cinnamon and ginger essential oils. African Journal of Biochemistry Research. 4: 167-174.

Eler, G., A. V. C. Gomes, B. S. Trindade, L. S. L. Almeida, F. Dilelis, V. S. Cardoso, and C. A. R. Lima. 2019. Oregano essential oil in the diet of broilers: Performance, carcass characteristics, and blood parameters. South African Journal of Animal Science. 49: 753-762.

Elgart, A., Y. Aldouby, A. J. Domb, and A. Hoffman. 2013. Improved oral bioavailability of BCS class 2 compounds by self nano emulsifying drug delivery systems (SNEDDS): The underlying mechanisms for amiodarone and talinolol. Pharmaceutical Research. 30: 3029-3044.

Elmarzugi, N. A. and H. E. Enshasy. 2013. Preparation and evaluation of olive oil nanoemulsion using sucrose monoester. International Journal of Pharmachy and Pharmaceutical Sciences. 5: 434-440.

Elsona, C. E., G. L. Underbakkel, P. Hansoni, E. Shragoa, R. H. Wainberg, and A. Qureshia. 1989. Impact of lemongrass oil, an essential oil, on serum cholesterol. Lipids. 24: 677-679.

Etim, N., M. E. Williams, U. A. Bio, and E. A. Offiong. 2014. Haematological parameters and factors affecting their values. Agricultural Science. 2: 37-47.

Fahmi, M., Y. Fahrimal, D. Aliza, H. Budiman, S. Aisyah, dan M. Hambal. 2015. Gambaran histopatologis hati tikus (*Rattus novergicus*) yang diinfeksi trypanosoma evansi setelah pemberian ekstrak kulit batang jaloh (*Salix tetrasperma* Roxb.). Jurnal Medika Veterinaria. 9: 141–145.

Fahrezi, F. K. 2020. The effect of fingerroots (*Boesenbergia pandurata* Roxb. S.) extract added in drinking water on carcass production of broiler chickens in closed house system. Skripsi. Fakultas Peternakan, Universitas Gadjah Mada, Yogyakarta.

Faix, S., Z. Faixova, I. Placha, and J. Koppel. 2009. Effect of *Cinnamomum zeylanicum* essential oil on an tioxidative status in broiler chickens. Acta Veterinaria Brno. 78: 411 - 417.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Farouk, A., R. Fikry, and M. Mohsen. 2016. Chemical composition and antioxidant activity of *Ocimum basilicum* L. essential oil cultivated in Madinah Monawara, Saudi Arabia, and its comparison to the Egyptian chemotype. Journal of Essential Oil Bearing Plants. 19: 1119-1128.

Feng, J., M. Lu, J. Wang, H. Zhang, K. Qiu, G. Qi, and S. Wu. 2021. Dietary oregano essential oil supplementation improves intestinal functions and alters gut microbiota in late phase laying hens. Journal of Animal Science and Biotechnology. 12: 1-15.

Gao, P. and Morozowich. 2004. Development of supersaturable self emulsifying systems (SMEDDS) for oral bioavailability enhancement of simvastatinin drug delivery system formulations for improving the oral absorbing beagle dogs. International Journal of Pharmaceutics. 274: 65-73.

Ghanem, G. H., R. E. S. Mahmoud, H. E. S. Gadalla, and S. S. Ibrahim. 2021. Egg productive performance, serum lipid profile, and economic efficiency of laying hen fed different levels of cinnamon oil supplemented diet. Advances in Animal and Veterinary Sciences 12: 1-7.

Ghanima, M. A. and M. A. El-Hack. 2020. Effect of housing system and rosemary and cinnamon essential oils on layers performance, egg quality, haematological traits, blood chemistry, immunity, and antioxidant. Animals. 10: 1-11.

Ghazanfari, S., M. A. Moradi, and M. M. Bardzardi. 2013. Intestinal morphology and microbiology of broiler chicken fed diets containing myrtle (*Myrtus communis*) essential oil supplementation. Iranian Journal of Applied Animal Science. 4: 549-554.

Ghazanfari, S., Z. Mohammadi, and A. Moradi. 2015. Effects of coriander essential oil on the performance, blood characteristics, intestinal microbiota, and histological of broilers. Brazilian Journal of Poultry Science. 17: 1-8.

Giannenas, I., A. Tzora, I. Sarakatsianos, A. Karamoutsios, S. Skoufos, N. Papaioannou, I. Anastasiou, and I. Skoufos. 2016. The effectiveness of the use of oregano and laurel essential oils in chicken feeding. Annals of Animal Science. 16: 779-796.

Goldstein, J. L. and M. S. Brown. 1990. Regulation of the mevalonat pathway. Nature. 343: 425-430.

Gopi, M. 2014. Essential oils as a feed additive in poultry nutrition. Advances in Animal and Veterinary Sciences. 2: 1-7.

Grasteau, S. M., A. Boissy, J. Bouixc, J. M. Faurea, A. D. Fisherd, G. N. Hinch, P. Jensen, P. L. Neindre, P. Mormede, P. Prunet, M. Vandeputtei, and C. Beaumont. 2005. Genetics of adaptation and domestication in livestock. Livestock Production Science. 93: 3-14.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Grobas, S., J. Mendez, R. Lazaro, C. D. Blas, and G. G. Mateos. 2001. Metabolism and nutrition influence of source and percentage of fat added to diet on performance and fatty acid composition of egg yolks of two strains of laying hens. Poultry Science. 80: 1171-1179.

Gropper S. and J. Smith. 2012. Advanced Nutrition and Human Metabolism, 6th ed. Cengage Learning, California.

Gul, M., A. Yoruk, M. Aksu, T. Kaya, and A. Kaynar. 2012. The effect of different levels of canola oil on performance, egg shell quality, and fatty acid composition of laying hens. International Journal of Poultry Science. 11: 769-776.

Gupta, A., H. B. Eral, T. A. Hatton, and P. S. Doyle. 2016. Nanoemulsions: Formation, properties, and applications. Soft Matter. 12: 2826-2841.

Gusma, G. M., R. Sutrisna, dan Erwanto. 2015. Pengaruh ransum dengan kadar serat kasar berbeda terhadap organ dalam ayam jantan tipe medium umur 8 minggu. Jurnal Ilmiah Peternakan Terpadu. 3: 6-11.

Guzman, P., B. Saldana, H. A. Mandalawi, A. P. Bonilla, R. Lazaro, and G. G. Mateos. 2015. Productive performance of brown egg laying pullets from hatching to 5 weeks of age as affected by fiber inclusion, feed form, and energy concentration of the diet. Poultry Science. 94: 249-261.

Habibi, M. R., M. Laroche, and M. O. Richard. 2014. The roles of brand community and community engagement in building brand trust on social media. Computers in Human Behavior. 37: 152-161.

Habiburahman, R., C. Sumantri, S. Darwati, dan Rukmiasih. 2020. Produksi telur dan kualitas telur ayam IPB D-1 G7 serta pendugaan nilai ripitabilitasnya. Jurnal Ilmu Produksi dan Teknologi Hasil Ternak. 8 : 97-101.

Hack, E. A., M. T. Saadony, A. M. Saad, H. M. Salem, N. M. Ashry, M. M. Abo, M. Shukry, A. A. Swelum, A. E. Taha, A. M. Tahan, S. F. Abu, and K. A. Tarabily. 2022. Essential oils and their nanoemulsions as green alternatives to antibiotics in poultry nutrition: A comprehensive review. Poultry Science. 101: 1-21.

Haida, Z. and M. Hakiman. 2019. A comprehensive review on the determination of enzymatic assay and nonenzymatic antioxidant activities. Food Science and Nutrition. 7: 1555–1563

Hall, L. M. and J. C. McKay. 1992. Variation in egg yolk cholesterol concentration between and within breeds of the domestic fowl. British Poultry Science. 33: 941-946.

Halliwell, B. 1989. Current status a review: Free radicals, reactive oxygen species and human disease: A critical evaluation with special reference to atherosclerosis. London Journal Experts. 70: 737-757.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Hammad, S. M., H. S. Siegel, and H. Marks. 1998. Dietary cholesterol effects on plasma and yolk cholesterol fractions in selected lines of Japanese quail. Poultry Science. 75: 933-942.

Hanifah, M. and M. Jufri. 2018. Formulation and stability testing of nanoemulsion lotion containing *Centella asiatica* extract. Journal of Young Pharmacists. 10: 404-408.

Hao, Y., Y. Liu, R. Yang, X. Zhang, J. Liu, and H. Yang. 2018. A pH responsive TiO_2 based pickering emulsion system for in situ catalyst recycling. Chinese Chemical Letters. 29: 778-782.

Harder, M. N. C., S. G. C. Brazaca, A. A. D. Coelho, V. J. M. Savino, and C. F. O. Franco. 2007. Cholesterol and iron availability in yolk of laying hens feed with annatto (*Bixa orellana*). Animal. 1: 477-482.

Hardiningtyas, S. D., S. Purwaningsih, dan E. Handharyani. 2014. Aktivitas antioksidan dan efek hepatoprotektif daun bakau api-api putih. Jurnal Pengolahan Hasil Perikanan Indonesia. 17:80-91.

Hartadi, H., S. Reksohadiprodjo, dan A. D. Tillman. 2019. Tabel komposisi pakan untuk Indonesia, 7th . UGM Press, Yogyakarta.

Hashemipour, H., H. Kermanshahi, A. Golian, and A. Raji. 2014. Effect of antibiotic alternatives on ileal microflora and intestinal histomorphology of broiler chickens fed wheat based diet. Iranian Journal of Applied Animal Science. 4:135-142.

Hasyim, Z., N. Djide, dan Syamsuddin. 2015. Potensi pemanfaatan cacing tanah *Lumbricus rubellus* dalam mengantisifasi flu burung melalui deteksi protein imunoglobin Y (IG/Y) ternak ayam ras. Jurnal Alam dan Lingkungan. 6: 1-5.

He, X., D. Hao, C. Liu, X. Zhang, D. Xu, X. Xu, J. Wang, and R. Wu. 2017. Effect of supplemental oregano essential oils in diets on production performance and relatively intestinal parameters of laying hens. American Journal of Molecular Biology. 7: 73-85.

Heeren, J. and L. Scheja. 2021. Metabolic associated fatty liver disease and lipoprotein metabolism. Molecular Metabolism. 50: 1-17.

Hernandez, F., J. Madrid, V. Garcia, J. Orengo, and M. D. Megias. 2004. Influence of two plant extracts on broilers performance, digestibility, and digestive organ size. Poultry Science. 83: 169-174.

Hincke, M. T. 2012. The eggshell: Structure, composition, and mineralization. Frontiers in Bioscience. 17: 1-15.

Hirasa K. and M. Takemasa. 1998. Spice Science and Technology, 1st. Marcel Dekker, Inc., New York.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Hoan, D. N., T.Q. Hien, and T.T. Hoan. 2016. Egg production performance of the local RI hen and its crossbreeds with ISA Brown Strain in semi intensive conditions. Bulgarian Journal of Agricultural Science. 22: 87-91.

Hoffman, R., E. J. Benz, S. J. Shattil, B. Furie, H. Cohen, L. E. Silberstein, and P. McGlave. 2013. Hematology: Basic Principles and Practice, 7th. Aubrey Durkin, New York.

Holm, R. and I. H. M. Jensen. 2006. Optimization of self microemulsifying drug delivery systems (SMEDDS) using a D-optimal design and the desirability function. Drug Development and Industrial Pharmacy. 32: 1025-1032.

Hong, J., T. Steiner, A. Aufy, and T. Lien. 2012. Effect of supplemental essential oil on growth performance, lipid metabolites and immunity, intestinal characteristics, microbiota and carcass traits in broilers. Livestock Science. 144: 253-262.

Horvath, G. 2016. Disk diffusion sensitivity of ESBL producing Gram negatif bacteria to essential oils, plant extracts, and their isolated compounds disk diffusion method, 1st ed. Academic press, Budapest.

Houshmand, M., M. N. Shahraki, and M. R. B. Behzadi. 2018. Evaluation of miswak (*Salvadora persica*) as a herbal additive in broiler chickens. Poultry Science Journal. 6: 89-97.

Hua, X., Y. J. Fu, Y. G. Zu, L. Zhang, W. Wang, and M. Luo. 2011. Determination of pinostrobin in rat plasma by LC-MS/MS: Application to pharmacokinetics. Journal of Pharmaceutical and Biomedical Analysis. 56: 841–845.

Huang, J., C. Qian, H. Xu, and Y. Huang. 2018. Antibacterial activity of *Artemisia asiatica* essential oil against some common respiratory infection causing bacterial strains and its mechanism of action in *Haemophilus influenzae.* Microbial Pathogenesis. 114: 470–475.

Incharoen, T., K. Yamauchi, T. Erikawa, and H. Goto. 2010. Histology of intestinal villi and epithelial cells in chicken fed low crude protein or low crude fat diets. Italian Journal of Animal Science 9: 429-434.

Iskender, H., G. Yenice, E. Dokumacioglu, O. Kaynar, A. Hayirli, and A. Kaya. 2017. Comparison of the effects of dietary supplementation of flavonoids on laying hen performance, egg quality and egg nutrient profile. British Poultry Science. 58: 550–556.

Jahantigh, M., K. Samadi, R. E. Dizaji, and S. Salari. 2020. Antimicrobial resistance and prevalence of Tetracycline resistance genes in *Escherichia coli* isolated from lesions of colibacillosis in broiler chickens in Sistan, Iran. BMC Veterinary Research. 16: 1-6.

Jakobisiak, M., and J. Golab. 2003. Potential antitumor effects of statins. International Journal of Oncology. 23: 1055–1069.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Jantan, I. B., I. Basni, A. S. Ahmad, N. A. Ali, A. R. Ahmad, and H. Ibrahim. 2001. Constituents of the rhizome oils of *Boesenbergia pandurata* (Roxb.) Schlecht from Malaysia, Indonesia, and Thailand. Flavour and Fragrance Journal. 16: 110-112.

Jantapan, K. A., K. Poapolathep, S. Imsilp, P. Poapolathep, P. Tanhan, S. Kumagai, and U. Jermnak. 2017. Inhibitory effects of thai essential oils on potentially aflatoxigenic *Aspergillus parasiticus* and *Aspergillus flavus*. Biocontrol Science. 22: 31-40.

Jeong, M., P.B. Park, D. Kim, Y. Jang, H.S. Jeong, and S. Choi. 2009. Essential oil prepared from *Cymbopogon citrates* exerted an antimicrobial activity against plant pathogenic and medical microorganisms. Mycobiology. 37: 48-52.

Jensen, L. S., G. W. Schumaier, and J. D. Lathshaw, 1970. "Extra caloric" effect of dietary fat for developing turkeys as influenced by calorie: Protein ratio. Poultry Science. 49: 1697-1704.

Jiang, F., G. Wu, W. Li, J. Yang, J. Yan, Y. Wang, W. Yo, X. Zhou, Z. He, L. Wu, C. Xiao, T. Xiao, M. Zhang, X. Shen, and L. Tao. 2019. Preparation and protective effects of 1,8-sineole loaded self microemulsifying drug delivery system on lipopolysaccharide induced endothelial injury in mice. European Journal of Pharmaceutical Sciences. 127: 14-23.

Johnson, A. M., G. Anderson, M. A. Ramos, A. A. Ali. 2022. Effect of dietary essential oil of oregano on performance parameters, gastrointestinal traits, blood lipid profile, and antioxidant capacity of laying hens during the pullet phase. Frontiers in Animal Science. 3: 1-11.

Joye, I. J. and D. J. McClements. 2013. Production of nanoparticles by anti solvent precipitation for use in food systems. Trends in Food Science and Technology. 34: 109-123.

Jyothi, J. B. and K. Sreelakshmi. 2011. Design and evaluation of self nanoemulsifying drug delivery system of flutamide. Journal of Young Pharmacists. 3: 4-8.

Karoui, R., D. Ketelaere, B. Kemps, B. Bamelis, F. Mertens, and K. D. J. Baerdemaeker. 2009. Eggs and Egg Products. Infrared Spectroscopy for Food Quality Analysis and Control., 1th. Academic Press, San Diego.

Kassem, A. A., A. M. Mohsen, R. S. Ahmed, and T. M. Essam. 2016. Self-nanoemulsifying drug delivery system (SNEDDS) with enhanced solubilization of nystatin for treatment of oral candidiasis: Design, optimization, *in vitro* and *in vivo* evaluation. Journal of Molecular Liquids. 218: 219-232.

Kaur, G., Chandel, and P. Harikumar. 2013. Formulation development of self nanoemulsifying drug delivery system (SNEDDS) of celecoxib for improvement of oral bioavailability. Pharmacophore. 4: 120-133.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Ketta, M. and E. Tumova, 2016. Eggshell structure, measurements, and quality-affecting factors in laying hens: A review. Journal of Animal Science. 61: 299-309.

Khairul, M., A. Baharudin, S. A. Hamid, and D. Susanti. 2015. Chemical composition and antibacterial activity of essential oils from three aromatic plants of the Zingiberaceae family in Malaysia. Journal of Physical Science. 26: 71-81.

Khaksar, V., M. Krimpen, H. Hashemipor, and M. Pilevar. 2012. Effects of thyme essential oil on performance, some blood parameters, and ileal microflora of Japanese quail. Journal of Poultry Science. 49: 106-110.

Khan, A. W., S. Kotta, S. H. Ansari, R. K. Sharma, and J. Ali. 2015. Self-nanoemulsifying drug delivery system (SNEDDS) of the poorly water soluble grapefruit flavonoid Naringenin: Design, characterization, *in vitro*, and *in vivo* evaluation. Drug Delivery Journal. 22: 552-561.

Khan, S., R. J. Moore, D. Stanley, and K. K. Chousalkar. 2020. The gut microbiota of laying hens and its manipulation with prebiotics and probiotics to enhance gut health and food safety. Applied and Environmental Microbiology. 86: 1-18.

Khataee, A., P. Gholami, D. Kalderis, E. Pachatouridou, and M. Konsolakis. 2018. Preparation of novel CeO_2 biochar nanocomposite for sonocatalytic degradation of a textile dye. Ultrasonics Sonochemistry. 41: 503-513.

Kim, C. H. and H. K. Kang. 2022. Effects of energy and protein levels on laying performance, egg quality, blood parameters, blood biochemistry, and apparent total tract digestibility on laying hens in an aviary system. Animals. 12: 1-10.

Kladniew, B. R., M. Polo, S. M. Villegas, M. Galle, R. Crespo, and M. G. D. Bravo. 2014. Synergistic antiproliferative and anticholesterogenic effects of linalool, 1,8-cineole, and simvastatin on human cell lines. Chemico Biological Interactions. 214: 57-68.

Knobloch, K., A. Pauli, B. Iberl, H. Weugand, and N. Weis. 1989. Antibacterial and antifungal properties of essential oil components. Journal of Essential Oil Research. 1: 118-119.

Kpomasse, C. C., O. E. Oke, F. M. Houndonougbo, and K. Tona. 2021. Broiler production challenges in the tr opics: A review. Veterinary Medicine and Science. 7: 831-842.

Kreydiyyeh, S. I., J. Usta, and R. Copti. 2000. Effect of cinnamon, clove, and some of their constituents on the Na^+-K^+-ATPase activity and alanine absorption in the rat jejunum. Food and Chemical Toxicology. 38: 1-10.

Kuang, H., F. Yang, Y. Zhang, T. Wang, and G. Chen. 2018. The impact of egg nutrien composition and its consumption on cholesterol homeostasis. Hindawi Cholesterol. 2018: 1-23.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Kumar, R. S., U. S. Syamala, P. Revathi, S. Devaki, P. Raghuveer, and K. Gowthamarajan. 2013. Self nanoemulsifying drug delivery system of olanzapine for enhanced oral bioavailability: *In vitro*, *in vivo* characterisation and *in vitro, in vivo* correlation. Journal of Bioequivalence and Bioavailability. 5: 201-208.

Kumar, M., V. Kumar, D. Roy, R. Kushaha, and S. Vaiswani. 2014. Application of herbal feed additives in animal nutrition. A review. International Journal of Livestock Research. 4: 1-8.

Kumar, P. G. 2015. Nanoemulsion based targeting in cancer therapeutics. Journal of Medicinal Chemistry. 5: 272-284.

Kumarappan, C., M. Vijayakumar, E. Thilagam, M. Balamurugan, M. Thiagarajan, S. Senthil, S. C. Das, and S. C. Mandal. 2011. Protective and curative effects of polyphenolic extracts from *Ichnocarpus frutescense* leaves on experimental hepatotoxicity by carbon tretrachloride and tamoxifen. Annals of Hepatology. 10: 63-72.

Kumari, A., R. Singla, A. Guliani, and S. K. Yadav. 2014. Review article: Nanoencapsulation for drug delivery. Exceli Journal. 13: 265-286.

Kurnia, D. 2019. Pertambahan bobot badan harian (PBBH) pada ayam layer starter grower yang diberi resveratrol tepung biji anggur. Jurnal Ternak.10: 7-13.

Kwasigroch, B., E. Escribano, M. C. Moran, J. Queralt, M. A. Busquets, and J. Estelrich. 2016. Oil in water nanoemulsions are suitable for carrying hydrophobic compounds: Indomethacin as a model of anti inflammatory drug. International Journal of Pharmaceutics. 515: 749-756.

Landoni, M. F. and G. Albarellos. 2015. The use of antimicrobial agents in broiler chickens. The Veterinary Journal. 205: 21-27.

Lee, J., Y. Kang, S. K. Heo, Y. J. Shin, D. W. Park, T. E. Han, G. G. Jin, G. D. Lee, H. B. Jung, and E. Kim. 2016. Influence of flaxseed oil on fecal microbiota, egg quality, and fatty acid composition of egg yolks in laying hens. Biological and Pharmaceutical Bulletin. 72: 259-266.

Lee, S., T. M. La, H. J. Lee, I. S. Choi, C. S. Song, S. Y. Park, J. B. Lee, and S. W. Lee. 2019. Characterization of microbial communities in the chicken oviduct and the origin of chicken embryo gut microbiota. Scientific Reports. 9: 1-11.

Leeson, S. and J. D. Summers. 2005. Commercial Poultry Nutrition, 3rd. Nottingham University Press, Nottingham.

Lestari, L., S. M. Mardiati, dan M. A. Djaelani. 2018. Kadar protein, indeks putih telur dan nilai haugh unit telur itik setelah perendaman ekstrak daun salam (*Syzygium polyanthum*) dengan waktu penyimpanan yang berbeda pada suhu 4°C. Buletin Anatomi dan Fisiologi. 3: 39-45.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Li, S. 2011. Enhancement of the antimicrobial activity of eugenol and carvacrol against *Escherichia coli*. 157:H7 by lecithin in microbiological media and food. Thesis. University of Tennessee, Knoxville, Tennessee.

Li, X., Z. Cai, X. Mei, S. Yun, and Z. Y. Li. 2020. Flavour, antimicrobial activity, and physical properties of composite film prepared with different surfactants. Food Science Nutrition. 8: 3099–3109.

Liu, C., W. Zheng, R. Xie, Y. Liu, Z. Liang, G. Luo, M. Ding, and Q. Liang. 2019. Microfluidic fabrication of water in water droplets encapsulated in hydrogel microfibers. Chinese Chemical Letters. 30: 457-460.

Liu, S. J., J. Wang, T. F. He, H. S. Liu, and X. S. Piao. 2021. Effects of natural capsicum extract on growth performance, nutrien utilization, antioxidant status, immune function, and meat quality in broilers. Poultry Science. 100: 1-8.

Luthfi, A. C., Suhardi, dan E. C. Wulandari. 2020. Produktivitas ayam petelur fase layer II dengan pemberian pakan *free choice feeding.* Tropical Animal Science. 2: 57-65.

Macelline, S. P., M. Toghyani, P. V. Chrystal, P. H. Selle, and S.Y. Liu. 2021. Amino acid requirements for laying hens: A comprehensive review. Poultry Science. 100: 1-19.

Maclennan, J. D. 2013. The histotoxic clostridial infections of man. Journal of American Society for Microbiology. 26: 177-274.

Madan, J. R., B. Sudarshan, V. S. Kadam, and D. Kamal. 2014. Formulation and development of self microemulsifying drug delivery system of pioglitazone hydrochloride. Asian Journal of Pharmaceutics. 27-35.

Mahila, P. 2011. Design and evaluation of self nanoemulsifying drug delivery system of flutamide. Journal of Young Pharmacists. 3: 8-12.

Malayoglu, H. B., S. Baysal, Z. Misirliogglu, M. Polat, H. Yilmaz, and N. Turan. 2010. Effects of oregano essential oil with or without feed enzymes on growth performance, digestive enzyme, nutrient digestibility, lipid metabolism, and immune response of broilers fed on wheat-soybean meal diets. British Poultry Science. 51: 67-80.

Ma'mun dan N. Nurdjannah. 1993. Pengaruh perajangan dan lama pelayuan terhadap rendemen dan mutu minyak serai dapur. Buletin Penelitian Tanaman Rempah dan Obat. 8: 1-5.

Marliyana, S. D., Y. M. Syah, dan D. Mujahidin. 2017. Aktivitas antibakteri secara *in vitro* terhadap bakteri isolat klinis turunan calkon dari rimpang *Kaempferia pandurata*. Jurnal Penelitian Kimia. 13: 41-51.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Martien, R., Adhyatmika, I. D. K. Irianto, V. Farida, and D. P. Sari. 2012. Technology developments nanoparticles as drug. Majalah Farmaseutik. 8: 133-144.

Martien, R., E. Wulandari, and A. Alverina. 2016. SNEDDS (self nanoemulsifying drug delivery system) formulation of β-carotene in olive oil (*Olea europaea*). International Journal of Advanced Research. 4: 1031-1043.

Marzuki, R. A. Wahab, and M. A. Hamid. 2019. An overview of nanoemulsion; Concepts of development and cosmeceutical applications. Biotechnology and Biotechnological Equipment. 33: 779-797.

Mason, T. G., J. N. Wilking, K. Meleson, C. B. Chang, and S. M. Graves. 2006. Nanoemulsions: Formation, structure, and physical properties. Journal of Physics Condensed Matter. 18: 1-34.

Matsumura, Y. and H. Maeda. 1986. A new concept for macromolecular therapeutics in cancer chemotherapy: Mechanism of tumoritropic accumulation of proteins and the antitumor agent smancs. Cancer Research. 46: 1-12.

McKay, J. C. 1994. Variation in plasma cholesterol concentration over time in the domestic fowl. British Poultry Science. 35: 631-634.

Mentari, A. S., L. D. Mahfudz, dan N. Suthama. 2014. Massa protein dan lemak daging pada ayam broiler yang diberi tepung temu kunci (*Boesenbergia pandurata* Roxb.) dalam ransum. Animal Agriculture Journal. 3: 211-220.

Mezaini, A., N. E. Chihib, A. D. Bouras, N. N. Arroume, and J. P. Hornez. 2009. Antibacterial activity of some lactic acid bacteria isolated from an algerian dairy product. Journal of Environmental and Public Health. 2009: 1-6.

Migliorini, M. J., M. M. Boiagoa, L. M. Stefania, A. Zampara, L. F. Rozaa, M. Barretaa, A. Arnoa, W. S. Robazzab, J. Giuriattia, A. C. Galvaob, C. Boscattoa, D. Paianoa, A. S. D. Silvaa, and F. C. Tavernari. 2019. Oregano essential oil in the diet of laying hens in winter reduces lipid peroxidation in yolks and increases shelf life in eggs. Journal of Thermal Biology. 85: 1-7

Miksusanti, B., S. L. Jennie, B. Ponco, dan G. Trimulyadi. 2008. Kerusakan dinding sel *Escherichia coli* oleh minyak atsiri temu kunci (*Kaempferia pandurata*). Jurnal Ilmiah Nasional. 9: 1-8.

Mohan, B., R. Kadirvel, M. Bhaskaran, and A. Natarajan. 1995. Effect of probiotic supplementation on serum yolk cholesterol and on egg shell thickness in layers. British Poultry Science. 36: 799-803.

Moo, C. L., M. A. Osman, S. K. Yang, W. S. Yap, S. Ismail, S. H. E. Lim, C. M. Chong and K. S. Lai. 2021. Antimicrobial activity and mode of action of 1,8-cineol against carbapenemase producing *Klebsiella pneumoniae.* Scientifc Reports. 11: 1-13.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Mou, D., H. Chen, D. Du, C. Mao, J. Wan, H. Xu, and X. Yang. 2007. Hydrogel thickened nanoemulsion system for topical delivery of lipophilic drugs International. Journal of Pharmaceutics. 353: 270–276.

Mountzouris, K. C., P. Tsitrsikos, I. Palamidi, A. Arvaniti, M. Mohni, G. Schatzmayr, and K. Fegeros. 2010. Effects of probiotic inclusion levels in broiler nutrition on growth performance, nutrien digestibility, plasma immunoglobulins, and cecal microflora composition. Poultry Science. 89: 58-67.

Mudiana, I. W., I. G. N. Sudisma, N. L. E. Setiasih, dan I. W. Sudira. 2023. Gambaran histologi hati tikus putih (*Rattus norvegicus*) yang diberikan ekstrak bunga kecubung (*Datura metel* L.) sebagai anestesi. Acta Veterinaria Indonesiana. 11: 102-108.

Naber, E. C. 1976. The cholesterol problem, the egg, and lipid metabolism in the laying hen. Poultry Science. 55: 14-30.

Nabi, S. N., F. S. S. Talegaonkar, J. Ali, S. Baboota, A. Ahuja, R. K. Khar, and M. Ali. 2007. Formulation development and optimization using nanoemulsion technique: A technical note. American Association of Pharmaceutical Scientists. 8: 1-6.

Nahas, J. and M. R. Lefrancois. 2001. Effects of feeding locally grown whole barley with or without enzyme addition and whole wheat on broiler performance and carcass traits. Poultry Science. 80:195-202.

Naitali, F., D. Brissonnet, G. Cuvelier, M. Noelle, and Fontaine. 2009. Effects of pH and oil in water emulsions on growth and physicochemical cell surface properties of *Listeria monocytogenes*: Impact on tolerance to the bactericidal activity of disinfectants. International Journal of Food Microbiology.130: 101-107.

Nazzaro, F., L. D. Martino, R. Coppola, and V. D. Feo. 2013. Effect of essential oils on pathogenic bacteria. Pharmaceuticals. 6: 1451-1474.

Neijat, M., J. D. House, W. Guenter, and E. Kebreab. 2011. Calcium and phosphorus dynamics in commercial laying hens housed in conventional or enriched cage systems. Poultry Science. 90: 2383–2396.

Nevin K. G. and T. Rajamohan. 2008. Influence of virgin coconut oil on blood coagulation factors, lipid levels, and LDL oxidation in cholesterol fed *Sprague dawley* rats. The European e-Journal of Clinical Nutrition and Metabolism. 3: 1-8.

Nuraeni, C. dan R. Yunilawati. 2012. Identifikasi komponen kimia minyak atsiri temu giring (*Curcuma heyneana* Val.) dan temu kunci (*Kaempheria pandurata* Roxb.) hasil distilasi air uap. Jurnal Kimia Kemasan. 34: 187-191.

Nurrachma, M. Y., H. Fadliyah, and E. Meiyanto. 2018. Fingerroot (*Boesenbergia pandurata*): A prospective anticancer therapy. Indonesian Journal of Cancer Chemoprevention. 9: 102-109.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Oh, R. C., T. R. Hustead, S. M. Ali, and M. W. Pantsari. 2017. Mildly elevated liver transaminase levels: Causes and evaluation. American Family Physician. 96: 709-715.

Ohtani, K. and T. Shimizu. 2015. Regulation of toxin gene expression in *Clostridium perfringens*. Research in Microbiology. 166: 280-289.

Omana, D., J. Wang, and J. Wu. 2010. Ovomucin a glycoprotein with promising potential. Trends Food Science Technology. 21: 455-463.

Orzuna, J. F. and A. L. Bueno. 2023. Essential oils as a dietary additive for laying hens: Performance, egg quality, antioxidant status, and intestinal morphology: A Meta-Analysis. Agriculture. 13: 1-15.

Pan, D. and Z. Yu. 2013. Intestinal microbiome of poultry and its interaction with host and diet. Gut Microbes. 5: 108-119.

Panjaitan, G. P. 2008. Pengujian aktivitas hepatoprotektor akar pasak bumi (*Eurycoma longifolia* Jack.). Disertasi. Fakultas Peternakan, Institut Pertanian Bogor, Bogor.

Parmar, N., N. Singla, S. Amin, and K. Kohli. 2011. Study of cosurfactant effect on nanoemulsifying area and development of lercanidipine loaded (SNEDDS) self nanoemulsifying drug delivery system. Koloid Surfaces Biointerfaces. 86: 32-38.

Pateiro, M., B. Gomez, P. E. S. Munekata, F. J. Barba, P. Putnik, D. B. Kovacevic, and J. M. Lorenzo. 2021. Nanoencapsulation of promising bioactive compounds to improve their absorption, stability, functionality, and the appearance of the final food products. Molecules. 26: 1-26.

Patel, R. P. and J. R. Joshi. 2012. An overview on nanoemulsion: A novel approach. International Journal of Pharmacheutical Sciences and Research. 3: 4640-4650.

Pattanayak, M., P. K. Seth, S. Smita, and S. K. Gupta. 2009. Geraniol and limonene interaction with 3-hydroxy-3-methyl glutaryl CoA (HMG-CoA) reductase for their role as cancer chemo-preventive agents. Journal of Proteomics and Bioinformatics.11: 466–474.

Pattaratanawadee, E., C. Rachtanapun, P. Wanchaitanawong, and W. Mahakarnchanakul. 2006. Antimicrobial activity of spice extracts against patogenic and spoilage microorganisms. Kasetsart Journal (Natural Science). 40: 159-165.

Peffley, D. M. and A. K. Gayen. 2003. Plant derived monoterpenes suppress hamster kidney cell 3-hydroxy-3-methylglutaryl coenzyme A reductase synthesis at post transcriptional level. The Journal of Nutrition 133: 38–44.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Perez, E., A. Bernandos, R. M. Manez, and J. M. Barat. 2013. Nanotechnology in the development of novel functional foods or their package. An overview based in patent analysis. Recent Patents on Food, Nutrition, and Agriculture. 5: 35-43.

Pertiwi, D. D. R., R. Murwani, dan T. Yudiarti. 2017. Bobot relatif saluran pencernaan ayam broiler yang diberi tambahan air rebusan kunyit dalam air minum. Jurnal Peternakan Indonesia. 19: 61-65.

Platel, K. and K. Srinivasan, 2000. Influence of dietary spices and their active principles on pancreatic digestive enzymes in albino rats. Nahrung. 44: 42-46.

Polo, M. P. and D. M. G. Bravo. 2006. Effect of geraniol on fatty acid and mevalonate metabolism in the human hepatoma cellline HepG2. Biochemistry and Cell Biology. 84: 102-111.

Prakatur, I., M. Miskulin, M. Pavic, K. Marjanovic, V. Blazicevic, I. Miskulin, and M. Domacinovic. 2019. Intestinal morphology in broiler chickens supplemented with propolis and bee pollen. Journal of Animals. 9: 1-12.

Pratiwi, S. 2016. Uji efektivitas ekstrak daun cincau hijau rambat (*Cyclea barbata* Miers.) sebagai antibakteri terhadap *Bacillus cereus* dan *Shigella dysenteriae* secara *in vitro* dengan metode difusi. Skripsi. Fakultas Kedokteran, Universitas Pembangunan Nasional Veteran, Jakarta.

Prochnow, A. M., M. Clauson, J. Hong, and A. B. Murphy. 2016. Gram positive and Gram negative bacteria differ in their sensitivity to cold plasma. Scientific Reports. 6: 1-11.

Purwanti, S., Zuprizal, T. Yuwanta, and Supadmo. 2018. Physical and sensory quality of broiler meat as influenced by dietary supplementation of turmeric (*Curcuma longa*), Garlic (*Allium sativum*) and in combinations as a feed additive. Animal Production. 20: 61-69.

Purwati, D., M. A. Djaelani, dan E. Y. W. Yuniarti. 2015. Indeks Kuning Telur (IKT), Haugh Unit (HU) dan bobot telur pada berbagai itik lokal di Jawa Tengah. Jurnal Akademika Biologi. 4: 1-9.

Puvaca, N., D. Horvatex, S. T. Popovic, and S. Dordevic. 2020. Influence of tea tree (*Melaleuca alternifolia*) essential oil as feed supplement on production traits, blood oxidative status and treatment of coccidiosis in laying hens. Veterinarski Arhiv. 90: 331-340.

Rabbani, M., Abduh, dan E. Widodo. 2024. Pengaruh level minyak atsiri kulit jeruk keprok terhadap haugh unit, indeks kuning, dan putih telur dan warna kuning telur puyuh (*Coturnix Coturnix Japonica*). Thesis. Fakultas Peternakan, Universitas Brawijaya, Malang.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Rahma, W., R. Sutrisna, P. E. Santosa, dan F. Fathul. 2022. Pengaruh substitusi A. microphylla terhadap bobot karkas, prosentase lemak abdomen, bobot gizzard, dan panjang usus broiler. Jurnal Riset dan Inovasi Peternakan. 6 : 110-117.

Ramadas, N., H. Yajurvedi, and B. Rajaraman. 2019. Stress and glucose metabolism: A review. Journal of Clinical Medicine. 5: 8-12.

Rahmadi, A., I. Abdiah, M. D. Sukarno, dan T. Purnaningsih. 2013. Karakteristik fisikokimia dan antibakteri *virgin coconut oil* hasil fermentasi bakteri asam laktat. Jurnal Teknologi dan Industri Pangan. 24: 178-183.

Renden, J. A., F. H. Benoff, J. C. Williams, and R. D. Bushong. 1990. Examination of the physical characteristics in a diverse group of dwarf white leghorn pullets before and after first oviposition. Journal of Poultry Science. 69:16-26.

Rhyu, H. Y. 1979. Gas chromatographic characterization of sages of various geographic origins. Journal of Food Science. 44: 758-762.

Rita, I. 2011. Proses emulsifikasi dan analisis biaya produksi minuman emulsi minyak sawit merah. Tesis. Fakultas Matematika dan Ilmu Pengetahuan Alam, Institut Pertanian Bogor, Bogor.

Robert. 2011. Avian diseases which affect egg production and quality. Improving The Safety and Quality of Eggs and Egg Products. 1: 376-393.

Rosita, Y. 2011. Dampak plumbum dosis tunggal terhadap gambaran sel hati pada mencit (*Mus musculus* L.). Jurnal Kedokteran dan Kesehatan. 1: 123-132.

Rubiolo, P., B. Sgorbini, E. Liberto, C. Cordero, and C. Bicchi. 2010. Essential oils and volatiles: Sample preparation and analysis. A review. Flavour and Fragrance Journal. 25: 282-290.

Saeedi, M., K. M. Semnani, M. Rafati, and H. R. Kelidari. 2015. Evaluation of effect of Tween 80 on characteristics of tadalafil 0.1% suspension. Pharmaceutical and Biomedical Research. 1: 35-43.

Sahumena, M. H., Suryani, dan N. Rahmadani. 2019. Formulasi *self nanoemulsifiying drug delivery system* (SNEDDS) asam mefenamat menggunakan VCO dengan kombinasi surfaktan tween dan span. Journal Syifa Sciences and Clinical Research. 1: 37-46.

Saili, T., R. Aka, F. A. Auza, W. L. Salido, dan A. M. Sari. 2019. Kolesterol, asam urat, dan glukosa darah ayam buras yang diberi pakan dengan ramuan herbal dan ekstrak kerang bakau (*Polymesoda erosa*). Jurnal Ilmu dan Teknologi Peternakan Tropis. 6: 225-231.

Saki, A. A., H. Aliarabi, S. A. Hosseini, J. Salari, and M. Hashemi. 2014. Effect of a phytogenic feed additive on performance, ovarian morphology, serum lipid parameters and egg sensory quality in laying hen. Veterinary Research Forum. 5 : 287-293.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Salas, J. J., M. A. Bootello, E. M. Force, and R. Garces. 2003. Tropical vegetable fats and butters: properties and new alternatives. Innovation Technologie. 16: 254-258.

Salehifar, E., M. Abbasi, R. Bahari, and Kashani. 2017. Effects of myrtle (*Myrtus communis*) essential oil on growth performance, carcass characteristics, intestinal morphology, immune response, and blood parameters in broiler chickens. Journal of Livestock Science. 8: 63-71.

Salsabila, D. Garnida, dan D. Rahmat. 2022. Pengaruh ketebalan kerabang, bobot kerabang, dan bobot telur terhadap specific gravity telur ayam ras. Jurnal Ilmu Pertanian dan Peternakan. 10: 1-6.

Samiullah, J., R. Roberts, and K. K. Chousalkar. 2014. Effect of production system and flock age on egg quality and total bacterial load in commercial laying hens. Journal of Applied Poultry Research. 23: 59-70.

Sanders, E. 2012. Aseptic Laboratory Techniques: Plating Methods. Journal of Visualized Experiments. 63: 1-18.

Saraswati, P. W., K. A. Nocianitri, dan N. M. I. H. Arihantana. 2021. Pola pertumbuhan *Lactobacillus sp*. F213 selama fermentasi pada sari buah terung belanda (*Solanum betaceum* Cav.). Jurnal Ilmu dan Teknologi Pangan. 10: 621-663.

Sarica, M., H. Onder, and U. S. Yamak. 2012. Determining the most effective variables for egg quality traits of five hen genotypes. International Journal of Agriculture Biology. 14: 235-240.

Sartika, R. A. D. 2008. Pengaruh asam lemak jenuh, tidak jenuh, dan asam lemak trans terhadap kesehatan. Kesmas. 4: 154-160.

Saulawa, L. A., S. N. Ukachukwu, O. C. Onwudike, M. G. Garba, and A. Aruwayo. 2014. Quantitative substitution of raw baobab (*Adansonia digitata*) seed meal for soyabean meal in broiler starter diet. International Journal of Poultry Science. 13: 335-339.

Scott, M. L., M. C. Nesheim, and R. J. Young. 1982. Nutrition of The Chicken. 3rd Ed. M. L. Scott and Associates Ithaca, New York.

Sedaghat, A. and M. A. Torshizi. 2017. Immune responses, intestinal microbiota, performance, and blood characteristics of Japanese quail fed on diets containing camphor. Animal. 11: 2139-2146.

Setiawati, T., R. Afnan, dan N. Ulupi, 2016. Performa produksi dan kualitas telur ayam layer pada sistem litter dan cage dengan suhu kandang berbeda. Jurnal Ilmu Produksi dan Teknologi Hasil Peternakan. 4: 1-7.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Shakeel, F., N. Haq, F. K. Alanazi, and I. A. Alsarra. 2013. Impact of various nonionic surfactants on self nanoemulsification efficiency of two grades of capryol (capryol 90 and capryol pgmc). Journal of Molecular Liquids. 182: 57-63.

Sharma, N. and S. Shukla. 2011. Hepatoprotective potential of aqueous extract of *Butea monosperma* against CCL induced damage in rats. Experimental and Toxicologic Pathology. 63: 671-676.

Shterzer, N., N. Rothschild, Y. Sbehat, E. Stern, A. Nazarov, and E. Mills. 2020. Large overlap between the intestinal and reproductive tract microbiomes of chickens. Frontiers in Microbiology. 11: 3-9.

Shu, L. Z., Y. D. Ding, Q. M. Xue, W. Cai, and H. Deng. 2023. Direct and indirect effects of pathogenic bacteria on the integrity of intestinal barrier. Therapeutic Advances in Gastroenterology. 16: 1-17.

Si, W., J. Gong, R. Tsao, T. Zhou, H. Yu, C. Poppe, R. Johnson, and Z. Du. 2006. Antimicrobial activity of essential oils and structurally related synthetic food additives towards selected pathogenic and beneficial gut bacteria benefical gut bacteria. Journal of Applied Microbiology. 100: 296-305.

Silalahi, M. 2017. *Boesenbergia rotunda* (L.). Mansfeld: Manfaat dan metabolit sekundernya. Jurnal Education and Mathematics Science.1: 107-118.

Silhavy, T. J., D. Kahne, and S. Walker. 2010. The bacterial cell envelope. Cold Spring Harbor Perspectives in Biology. 2: 1-16.

Simon, K., M. B. Verwoolde, J. Zhang, H. Smidt, G. D. V. Reilingh, B. Kemp, and A. Lammers. 2015. Long-term effects of early life microbiota disturbance on adaptive immunity in laying hens. Poultry Science. 95:1543-1554.

Simons, L. A., S. G. Amansec, and P. Conway. 2006. Effect of *Lactobacillus fermentum* on serum lipids in subjects with elevated serum cholesterol. Nutrition, Metabolism, and Cardiovascular Diseases. 16: 531-535.

Skwirzynska, M. A. and D. Szczerbi'nska. 2019. The effect of lavender (*Lavandula angustifolia*) essential oil as a drinking water supplement on the production performance, blood biochemical parameters, and ileal microflora in broiler chickens. Poultry Science. 98: 358-365.

Sloan, D. R., R. H. Harms, G. B. Russell, and W. G. Smith. 1994. The relationship of egg cholesterol to serum cholesterol, serum calcium, feed consumption, and dietary cholecalciferol. Poultry Science. 73: 472-475.

Song, J., K. Xiao, Y. L. Ke, L. F. Jiao, C. H. Hu, Q. Y. Diao, B. Shi, and X. T. Zou. 2014. Effect of probiotic mixture on intestinal microflora, morphology, and barrier integrity of broilers subjected to heat stress. Poultry Science. 93: 581-588.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Stadelman, W. J. and J. Cotterill. 1977. Egg science and technology, 4th ed. The Avi Publishing Inc, Wetsport.

Sugumar, S., S. K. Clarke, M. J. Nirmala, B. K. Tyagi, A. Mukherjee, and N. Chandrasekaran. 2014. Nanoemulsion of eucalyptus oil and its larvicidal activity against *Culex quinquefasciatus*. Bulletin of Entomological Research. 104: 393-402.

Suk, Y. O. and C. Park. 2001. Effect of breed and age of hens on the yolk to albumen ratio in two different genetic stocks. Poultry Science. 80: 855-858.

Sukmaningbayu, A. J., S. A. Sudjarwo, dan R. S. Setiabudi. 2016. Efek terapeutik ekstrak *Spirulina platensis* pada gambaran histopatologi kerusakan hati tikus (*Rattus norvegicus*) yang diinduksi ethanol. Veterina Medika. 9: 23-30.

Surai, P. F. 2002. Selenium in poultry nutrition 1. Antioxidant properties, deficiency, and toxicity. World's Poultry Science. 58: 333-347.

Svihus, B. 2013. Function of the digestive system presented as a part of the informal nutrition symposium "From research measurements to application: Bridging the gap" at the poultry science association's annual meeting in San Diego, California, July 22-25, 2013. Journal of Applied Poultry Research. 23: 306-314.

Swamy, M. K., M. S. Akhtar, and U. R. Sinniah. 2016. Antimicrobial properties of plant essential oils against human pathogens and their mode of action: An updated review. Evidence Based Complementary and Alternative Medicine. 2016: 1-22.

Talebi, A., S. A. Rezaei, R. Chai, and Sahraei. 2005. Comparative studies on haematological values of broiler strains (Ross, Cobb, Arbor acres, and Arian). International Journal of Poultry Science. 4: 573-579.

Teja, P. T. H., A. A. G. Arjana, N. L. E. Setiasih, dan I. M. Merdana. 2021. Dampak minyak rajas yang diberikan secara oral terhadap histopatologi hati dan aktivitas aminotransferase ayam kampung Jantan. Indonesia Medicus Veterinus. 10: 233-244.

Thaxton, J. P. and S. Puvadolpirod. 2010. Model of physiological stress in chickens. Poultry Science. 79: 363-369.

Thrall, M. A., G. Weiser, R. Allison, and T. W. Campbell. 2012. Veterinary Hematology and Clinical Chemistry, 2nd. John Wiley & Sons, Colorado.

Tombarkiewicz, B., K. Trzeciak, B. Bojarski, and M. Lis. 2020. The effect of methionine and folic acid administered *in ovo* on the hematological parameters of chickens (*Gallus gallus* domesticus). Poultry Science. 99: 4578-4585.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Torki, M., S. S. Gooya, and H. Mohammadi. 2018. Effects of adding essential oils of rosemary, dill, and chicory extract to diets on performance, egg quality, and some blood parameters of laying hens subjected to heat stress. Journal of Applied Animal Research. 46: 1118-1126.

Torki, M., A. Mohebbifar, and H. Mohammadi. 2021. Effects of supplementing hen diet with *Lavandula angustifolia* and/or *Mentha spicata* essential oils on production performance, egg quality and blood variables of laying hens. Veterinary Medical Science. 7`: 184-193.

Trinitariyani, P., A. Winarso, dan A. I. R. Detha. 2022. Pengaruh suhu dan lama penyimpanan pada kualitas fisik dan mikrobiologis telur ayam ras. Jurnal Veteriner Nusantara. 6: 1-10.

Tsai, M. J., Y. S. Fu, Y. H. Lin, Y. B. Huang, and P. C. Wu. 2014. The effect of nanoemulsion as a carrier of hydrophilic compound for transdermal delivery. Plos One Journal. 9: 1-7.

Tubesha, Z., Z. A. Bakar, and M. Ismail. 2013. Characterization and stability evaluation of thymoquinone nanoemulsions prepared by high pressure homogenization. Journal of Nanomaterials. 6: 1-7.

Tungadi, R., N. A. Thomas, and W. G. V. Gobel. 2021. Formulasi, karakterisasi, dan evaluasi drops liquid self nanoemulsifying drug delivery system (SNEDDS) Astaxanthin. Indonesian Journal of Pharmaceutical Education. 1: 168-178.

Ujilestari, Zuprizal, R. Martien, and N. Dono, 2019. Optimization of self nanoemulsifying drug delivery systems of lemongrass (*Cymbopogon citratus*) essential oil. International Journal of Applied Pharmaceutics. 11: 144-149.

Ulupi, N. dan T. T. Ihwantoro, 2014. Gambaran darah ayam kampung dan ayam petelur komersial pada kandang terbuka di daerah tropis. Jurnal Ilmu Produksi dan Teknologi Hasil Peternakan. 2: 219-223.

Upadhyaya, I., A. Johny, M. J. Darre, and K. Venkitanarayanan. 2014. Efficacy of plant derived antimicrobials for reducing egg borne transmission of *Salmonella enteritidis*. Journal of Applied Poultry Research. 23: 330-339.

Vicente, J. L., C. Lopez, E. Avila, E. Morales, B. M. Hargis, and G. Tellez. 2007. Effect of dietary natural capsaicin on experimental *Salmonella enteritidis* infection and yolk pigmentation in laying hens. International Journal of Poultry Science. 6: 393-396.

Villar, A. M. S., B. C. Naveros, A. C. C. Campmanyc, M. A. Trenchs, C. B. Rocabert, and L. H. Bellowaa. 2018. Nanoemulsion: A novel platform for drug delivery system and evaluation of gelling potentials of *Hibiscus cannabinus* seed mucilage. Journal of Materials Science of Nanotechnology. 6: 1-11.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Vishal, P. 2018. Nanoemulsion: A novel platform for drug delivery system. Journal of Materials Science and Nanotechnology. 6: 1-11.

Vos, D. Y. and B. V. Sluis. 2020. Function of the endolysosomal network in cholesterol homeostasis and metabolic associated fatty liver disease (MAFLD). Molecular Metabolism. 50: 1-12.

Wahyuni, T., Yudiarti, E. Widiastuti, T. A. Sartono, I. Agusetyaningsih, and S. Sugiharto. 2021. Dietary supplementation of *Spirulina platensis* and *Saccharomyces cerevisiae* on egg quality, physiological condition and ammonia emission of hens at the late laying period. Journal of Indonesian Tropical Animal Agriculture. 48: 47-57.

Wahyuningsih, I. dan W. Putranti. 2015. Optimasi perbandingan Tween 80 dan polietilenglikol 400 pada formula *self nanoemulsifying drug delivery system* (SNEDDS) minyak biji jinten hitam. Indonesian Journal of Pharmacy. 12: 223-241.

Wang, J., R. Jia, H. Gong, P. Celi, Y. Zhuo, X. Ding, S. Bai, Q. Zeng, H. Yin, S. Xu, J. Liu, X. Mao, and K. Zhang. 2021. The effect of oxidative stress on the chicken ovary: Involvement of microbiota and melatonin interventions. Antioxidants. 10: 1-21.

Wasti, S., N. Sah, and B. Mishra. 2020. Impact of heat stress on poultry health and performances, and potential mitigation strategies. Animals. 10: 1-20.

Weisiger, R. A. and I. Fridovich. 1973. Superoxide dismutase: Organelle specificity. Journal of Biological Chemistry. 248. 3582-3592.

Widianingrum, D. C., C. T. Noviandi, and S. I. O. Salasia. 2019. Antibacterial and immunomodulator activities of *virgin coconut oil* (VCO) against *Staphylococcus aureus*. Heliyon. 5: 1-5.

Widodo, E. 2018. Ilmu Nutrisi Unggas, 6th. UB Press, Malang.

Winarti, L., L. Ameliana, and D. Nurahmanto. 2017. Formula optimization of orally disintegrating tablet containing meloxicam nanoparticles. Indonesian Journal of Pharmacy. 28: 53-64.

Wiyani, Z., Sabara, A. Aladin, dan M. Mustafiah. 2020. Pengaruh waktu dan kecepatan homogenisasi terhadap emulsi *virgin coconut oil* sari jeruk dengan *emulsifier* gum arab. Journal of Chemical Process Engineering. 5: 50-55.

Xiao, G., L. Zheng, X. Yan, L. Gong, Y. Yang, Q. Qi, X. Zhang, and H. Zhang. 2022. Effects of dietary essential oils supplementation on egg quality, biochemical parameters, and gut microbiota of late laying hens. Animals. 12: 1-10.

Yadav, D. 2014. Nanoemulsion gel as novel oil based colloidal nano carrier for topical delivery of bifonazole nano encapsulation of various herbal remedies view project. Indian Research Journal of Pharmacy and Science. 1: 36-54.

UNIVERSITAS
GADJAH MADA
**Efikasi nanoemulsi minyak atsiri temu kunci sebagai aditif air minum terhadap kesehatan organ dalam,
kinerja produksi, dan kualitas telur ayam layer**
Dyanovita Al Kurnia, Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Yang, H. M., Z. Yang, W. Wang, Z. Y. Wang, H. N. Sun, X. J. Ju, and X. M. Qi. 2014. Effects of different housing systems on visceral organs, serum biochemical proportions, immune performance, and egg quality of laying hens. European Poultry Science. 78: 1-9.

Yeoman, C. and B. White. 2014. Gastrointestinal tract microbiota and probiotics in production animals. Annual Review of Animal Biosciences. 2: 469-486.

Yilmaz, A., C. Tepeli, and T. Caglayan. 2011. External and internal egg quality characteristics in Japanese quails of different plumage color lines. Journal of Food, Agriculture, and Environment. 9: 375-379.

Yoshizawa, M., S. Maeda, A. Miyaki, M. Misono, Y. Choi, N. Shimojo, R. Ajisaka, and H. Tanaka. 2010. Additive beneficial effects of lactotripeptides intake with regular exercise on endothelium dependent dilatation in postmenopausal women. American Journal of Hypertension. 23: 368-372.

Yuliani, S. H., Y. Rahmadani, dan E. P. Istyastono. 2016. Uji iritasi sediaan gel penyembuh luka ekstrak etanol daun binahong menggunakan slug irritation test. Jurnal Ilmu Kefarmasian Indonesia. 14: 135-140.

Yunarto, N., N. Aini, I. S. Oktoberia, I. Sulistyowati, dan A. A. Kurniatri. 2019. Aktivitas antioksidan serta penghambatan HMG CoA dan lipase dari kombinasi ekstrak daun binahong rimpang temu lawak. Jurnal Kefarmasian Indonesia. 9: 89-96.

Yuwanta, T. 2004. Dasar Ternak Unggas, 5th. Kanisius, Yogyakarta.

Zaefarian, F., M. R. Abdollahi, and V. Ravindran. 2016. Particle size and feed form in broiler diets: Impact on gastrointestinal tract development and gut health. World's Poultry Science Journal. 72: 277-290.

Zainuddin, Masyitha, Y. Mulyana, dan Fitriani. 2014. Struktur histologi tembolok (ingluvies) pada unggas. Jurnal Medika Veterinaria. 8: 47-50.

Zhao, Y., C. Wang, H. L. Chow, K. Ren, T. Gong, Z. Zhang, and Y. Zheng. 2014. Self nanoemulsifying drug delivery system (SNEDDS) for oral delivery of Zedoary essential oil: Formulation and bioavailability studies. International Journal of Pharmaceutics. 383: 1-2.

Zita, L., E. Tumofa, and L. Stolc. 2009. Effects of genotype, age, and their interaction on egg quality in brown egg laying hens. Acta Veterinaria Brno. 78: 85-91.

Zuprizal. 2004. Antibiotik, probiotik, dan fitobiotik dalam pakan unggas. Majalah Poultry Indonesia. Edisi Januari 2004: 52-54.