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DAFTAR PUSTAKA

Berzal, G., García-González, M., Castejón, N., García-García, P., Fernández-Lorente, G., & Señoráns, F. J. (2023). Biocatalysts Based on Immobilized Lipases for the Production of Ethyl Esters of Fatty Acids including Bioactive Gamma-Linolenic Acid from Borage Oil. *Catalysts*, *13*(9), 1275. https://doi.org/10.3390/catal13091275

Duranova, H., Kuzelova, L., Fialkova, V., Simora, V., Kovacikova, E., Joanidis, P., Borotova, P., Straka, D., Hoskin, R. T., Moncada, M., De Medeiros, F. G. M., & Gabriny, L. (2025). Coconut-sourced MCT oil: Its potential health benefits beyond traditional coconut oil. *Phytochemistry Reviews*, *24*(1), 659–700. https://doi.org/10.1007/s11101-024-09969-1

Ekin, İ. (2019). Quality and composition of lipids used in biodiesel production and methods of transesterification: A review. *International Journal of Chemistry and Technology*. https://doi.org/10.32571/ijct.623165

Esipovich, A. L., Kanakov, E. A., Charykova, T. A., Otopkova, K. V., Smirnov, M. A., Mityukova, Y. A., & Belousov, A. S. (2024). A Comprehensive Study on Physicochemical Properties of Fatty Acid Esters Derived from Different Vegetable Oils and Alcohols and Their Potential Application. *Energies*, *17*(24), 6407. https://doi.org/10.3390/en17246407

Eskandari, Z., Hosseini, S. F., & Yaghmur, A. (2024). Production of Omega-3 Fatty Acid Concentrates from Common Kilka Oil: Optimization of the Urea Complexation Process. *Molecules*, 29(11), 2430. https://doi.org/10.3390/molecules29112430

Gulo, A. J., & Lubis, R. P. (2025). The Influence of Pure Coconut Oil Business on the Welfare of Coconut Farmers in Padang Bolak District, North Padang Lawas Regency. *Neraca Keuangan: Jurnal Ilmiah Akuntansi dan Keuangan*, *20*(1), 1–10. https://doi.org/10.32832/neraca.v20i1.17986

Helwani, Z., Amraini, S. Z., Rahman, S. A., Zahrina, I., Julhijah, N., & Ulfaa, S. M. (2024). Environmental Benefits of Palm Oil Biodiesel Enhancement: Urea Complexation Optimization via RSM. *Leuser Journal of Environmental Studies*. https://doi.org/10.60084/ljes.v2i2.214

Hidrotunnisa, H., Yanti, R., & Hidayat, C. (2025). Ethanolysis Pretreatment of Crude Palm Oil in *High Shear Reactor*. *Agritech*. https://doi.org/10.22146/agritech.81499

Jadhav, H. B., & Annapure, U. S. (2022). Triglycerides of medium-chain fatty acids: A concise review. *Journal of Food Science and Technology*, *60*(8), 2143–2152. Crossref. https://doi.org/10.1007/s13197-022-05499-w

Khairunnisa, A., Hanifah, S. N., Amalia, J., Juhana, B. B., & Primasari, A. (2025). Minyak Kelapa dan Potensi Sifat Fungsionalnya untuk Kesehatan dan Industri Pangan. *JURNAL Al-AZHAR INDONESIA SERI SAINS DAN TEKNOLOGI*. https://doi.org/10.36722/sst.v10i3.4632

Kosolapova, S. M., Smal, M. S., Pyagay, I., & Rudko, V. A. (2024). The Physicochemical Basis for the Production of Rapeseed Oil Fatty Acid Esters in a Plug Flow Reactor. *Processes*. https://doi.org/10.3390/pr12040788

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Liu, J., & Tao, B. (2022). Fractionation of fatty acid methyl esters via urea inclusion and its application to improve the low-temperature performance of biodiesel. *Biofuel Research Journal*. https://doi.org/10.18331/brj2022.9.2.3

Liu, J., Tao, B. Y., Feng, H., & Mosier, N. S. (2023). Efficient rapid fractionation of fatty acid methyl esters (FAMEs) through evaporative urea inclusion. *Chemical Engineering Journal*, *454*, 140266. https://doi.org/10.1016/j.cej.2022.140266

Magallanes, L. M., Tarditto, L. V., Grosso, N. R., Pramparo, M. C., & Gayol, M. F. (2019). Highly concentrated omega-3 fatty acid ethyl esters by urea complexation and molecular distillation. *Journal of the Science of Food and Agriculture*, *99*(2), 877–884. https://doi.org/10.1002/jsfa.9258

Maniam, G., Lim, H. S., & Hussin, N. M. (2023). Effect of Free Fatty Acid on Transesterification of Waste Cooking Oil. *Current Science and Technology*. https://doi.org/10.15282/cst.v3i1.10290

McCarty, M. F., & DiNicolantonio, J. J. (2016). Lauric acid-rich medium-chain triglycerides can substitute for other oils in cooking applications and may have limited pathogenicity. *Open Heart*, *3*(2), e000467. Crossref. https://doi.org/10.1136/openhrt-2016-000467

Moniz, P., Martins, D., Oliveira, A., Reis, A., & Silva, T. L. da. (2022). The Biorefinery of the Marine Microalga Crypthecodinium cohnii as a Strategy to Valorize Microalgal Oil Fractions. *Fermentation*. https://doi.org/10.3390/fermentation8100502

Oellig, C., Schunck, J., & Schwack, W. (2020). Determination of Mono- and Diacylglycerols from E 471 Food Emulsifiers in Aerosol Whipping Cream by High-Performance Thin-Layer Chromatography–Fluorescence Detection. *Analytical and Bioanalytical Chemistry*, *412*(6), 1381–1390. https://doi.org/https://doi.org/10.1007/s00216-020-02876-2

Sang, M., Pan, N., Wu, J., Chen, X., Cai, S., Fang, H., Xiao, M., Jiang, X., & Liu, Z. (2024). Reversed-Phase Medium-Pressure Liquid Chromatography Purification of Omega-3 Fatty Acid Ethyl Esters Using AQ-C18. *Marine Drugs*, *22*(6), 285. https://doi.org/10.3390/md22060285

Santana, J. L., Oliveira, J. M., Nascimento, J. S., Mattedi, S., Krause, L. C., Freitas, L. S., Cavalcanti, E. B., Pereira, M. M., Lima, Á. S., & Soares, C. M. F. (2020). Continuous flow reactor based with an immobilized biocatalyst for the continuous enzymatic transesterification of crude coconut oil. *Biotechnology and Applied Biochemistry*, bab.1885. https://doi.org/10.1002/bab.1885

Setyawardhani, D. A., Ihsani, I. F., Lestari, S. A. D., Zhafirah, H. R., Silvia, V., Fadilah, & Danarto, Y. C. (2024). CRYSTALLIZATION TEMPERATURE AND SOLVENT COMPOSITION EFFECT FOR ENHANCEMENT OF UNSATURATED FATTY ACIDS FROM PALM OIL USING UREA COMPLEXATION. *Jurnal Teknologi (Sciences & Engineering)*, *87*(1), 89–97. https://doi.org/10.11113/jurnalteknologi.v87.21669

Setyawardhani, D. A., Sulistyo, H., Sediawan, W. B., & Fahrurrozi, M. (2018). *Adsorption of saturated fatty acid in urea complexation: Kinetics and equilibrium studies*. 030013. https://doi.org/10.1063/1.5024072

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Subroto, E., Pangawikan, A. D., Yarlina, V. P., & Ramadhani, A. P. (2020). *The Extraction, Purification, and the Recent Applications of Coconut Oil in Food Products—A Review*.*International Journal on Emerging Technologies*, 11(5), 234–240.

Sun, Z., Qian, J., Fang, Y., Liu, M., Li, Y., Gong, F., Yan, G., Song, J., Ni, H., & Yu, L. (2024). The Enrichment of Docosahexaenoic Acid from Microalgal Oil by Urea Complexation via Rotary-evaporation Crystallization. *Journal of Oleo Science*, *73*(3), 311–319. https://doi.org/10.5650/jos.ess23179

Toumi, A., Politaeva, N., Đurović, S., Mukhametova, L., & Ilyashenko, S. (2022). Obtaining DHA–EPA Oil Concentrates from the Biomass of Microalga Chlorella sorokiniana. *Resources*, *11*(2), 20. Crossref. https://doi.org/10.3390/resources11020020

Uçar, B., Gholami, Z., Svobodová, K., Hradecká, I., & Hönig, V. (2024). A Comprehensive Study for Determination of Free Fatty Acids in Selected Biological Materials: A Review. *Foods*. https://doi.org/10.3390/foods13121891

Villanueva-Bermejo, D., Martín Hernández, D., Hurtado Ribeira, R., Hernández-Ramos, E. J., Fornari, T., Martín, D., & Vázquez, L. (2024). *Supercritical Concentration of Ethyl Laurate from Coconut Oil*. SSRN. https://doi.org/10.2139/ssrn.4906571

Wang, X., Zhang, Z.-J., Li, H.-Z., Hou, T.-Y., Zhao, Y.-N., & Li, H. (2022). Urea complexation combined with rapid preparative reversed-phase liquid chromatography to separate α-linolenic acid from perilla seed oil: Purity, *yield*, and oxidation stability. *Industrial Crops and Products, 187*, 115473. https://doi.org/10.1016/j.indcrop.2022.115473

Welberry, T. R. (2022). Urea inclusion compounds. In *Diffuse X-ray Scattering and Models of Disorder* (2nd ed., pp. 131–141). Oxford University Press. https://doi.org/10.1093/oso/9780198862482.003.0010

Xie, D., Chen, Y., Yu, J., Yang, Z., Wang, X., & Wang, X. (2023). Progress in enrichment of n-3 polyunsaturated fatty acid: A review. *Critical Reviews in Food Science and Nutrition*, *63*(32), 11310–11326. https://doi.org/10.1080/10408398.2022.2086852

Yuan, Y., Chen, Y., Yan, S., Liang, Y., Zheng, Y., & Dongdong, L. (2013). Molecular cloning and characterisation of an acyl carrier protein thioesterase gene (CocoFatB1) expressed in the endosperm of coconut (*Cocos nucifera*) and its heterologous expression in *Nicotiana tabacum* to engineer the accumulation of different fatty acids. *Functional Plant Biology*, 41(1), 80–86. https://doi.org/10.1071/FP13050

Zheng, Z., Dai, Z., Zheng, L., Zhang, L., & Xu, J. (2018). Enrichment of polyunsaturated fatty acids from seal oil through urea adduction and the fatty acids change rules during the process. *Journal of Food Processing and Preservation*, *42*(4), e13574. https://doi.org/https://doi.org/10.1111/jfpp.13593

Zulkanain, I. N., Ab-Rahim, S., Camalxaman, S., & Mazlan, M. (2020). Medium-chain fatty acids in nutritional therapy: A review. *Malaysian Journal of*

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Fundamental and Applied Sciences. https://doi.org/10.11113/MJFAS.V16N3.1610