

## REFERENCES

- Abd- ElGhany, M., Hegazy, A., Basuny, A., & Zaghlool, A. (2020). Using of red palm oil as milk fat healthy replacer in ice milk. *Al-Azhar Journal of Agricultural Research*, 45(1), 8–22. <https://doi.org/10.21608/ajar.2020.126614>
- Adhikari, P., Shin, J., Lee, J., Hu, J., Zhu, X., Akoh, C. C., & Lee, K. (2010). Production of *trans* -free margarine stock by enzymatic interesterification of rice bran oil, palm stearin and coconut oil. *Journal of the Science of Food and Agriculture*, 90(4), 703–711. <https://doi.org/10.1002/jsfa.3872>
- Albuquerque Da Silva, D., Manoel Da Cruz Rodrigues, A., Oliveira Dos Santos, A., Salvador-Reyes, R., & Meller Da Silva, L. H. (2023). Physicochemical and technological properties of pracaxi oil, cupuassu fat and palm stearin blends enzymatically interesterified for food applications. *LWT*, 184, 114961. <https://doi.org/10.1016/j.lwt.2023.114961>
- American Oil Chemists' Society. (2009). *Official Method Cd 3d-63: Acid Value*. AOCS
- American Oil Chemists' Society. (2009). *Official Method Cd 8-53: Peroxide Value*. AOCS
- Angrainy, H., Chandra, T., Anjali, C., & Utama, N. K. (2023). *Assessing the Influence of Butter-Substitution with Margarine in Sorbitol and Sucrose Cereal Bar Base: Taste, Texture, and Aroma Evaluation by Consumer Preference*. 5(2).
- Aondoakaa, I. P., Martini, S., & Akoh, C. C. (2025). Physical and chemical properties of low saturated zero trans-fat soft margarine formulated with blends of enzymatically modified soybean oil and mango kernel fat. *Food Chemistry*, 492, 145255. <https://doi.org/10.1016/j.foodchem.2025.145255>
- Arisiani, G., & Wibowo, S. (2022). Understanding Customer Preference of Margarine in Indonesia and Developing Marketing Strategy to Increase Revenue (Case Study of PT Asianagro Agungjaya). *Himalayan Journal of Economics and Business Management*, 3(2), 1–7.

- Asomaning, J., & Curtis, J. M. (2017). Enzymatic modification of egg lecithin to improve properties. *Food Chemistry*, 220, 385–392. <https://doi.org/10.1016/j.foodchem.2016.09.155>
- Association of Official Analytical Chemists. (2005). *Official Methods of Analysis (18 Edn)*. Association of Official Analytical Chemists Inc. Mayland. USA.
- Association of Official Analytical Chemists. (2011). *Official Method 969.17 Acid Value*. AOAC
- Baldeón Clavijo, D., Velásquez Rodríguez, F., & Castellanos Estupiñán, J. E. (2015). Utilización de plukenetia volubilis (sacha inchi) para mejorar los componentes nutricionales de la hamburguesa. *Enfoque UTE*, 6(2), 59–76. <https://doi.org/10.29019/enfoqueute.v6n2.60>
- Bandara, R. R., Louis-Gavet, C., Bryś, J., Mańko-Jurkowska, D., Górska, A., Brzezińska, R., Siol, M., Makouie, S., Palani, B. K., Obranović, M., & Koczoń, P. (2024). Enzymatic Interesterification of Coconut and Hemp Oil Mixtures to Obtain Modified Structured Lipids. *Foods*, 13(17), 2722. <https://doi.org/10.3390/foods13172722>
- Berdiansyah, S., & Arifan, F. (2023). Evaluation of the effect of sesame lecithin emulsifier generated from sesame oilwater degumming process on margarine production. *Food Research*, 7(1), 236–243. [https://doi.org/10.26656/fr.2017.7\(1\).553](https://doi.org/10.26656/fr.2017.7(1).553)
- Bolini, H. M. A., Medeiros, A. C., Pereira, C. T. M., Carraro, F., Augusto, P. P. C., Cardello, F., & Lima, R. S. (2023). *Assessing the Influence of Fat Content upon the Sensory and Textural Properties of Margarine to Guide the Development of Healthier Products*. Biology and Life Sciences. <https://doi.org/10.20944/preprints202312.0481.v1>
- Brenner, T., & Nishinari, K. (2014). A Note on Instrumental Measures of Adhesiveness and Their Correlation with Sensory Perception. *Journal of Texture Studies*, 45(1), 74–79. <https://doi.org/10.1111/jtxs.12050>
- Chan, Y.-J., Chiu, C.-S., Li, P.-H., & Lu, W.-C. (2024). Evaluation of different roasting condition on yield, physico-chemical characteristics, and antioxidant activity of cold-pressed sacha inchi (Plukenetia volubilis) oil. *LWT*, 203, 116343. <https://doi.org/10.1016/j.lwt.2024.116343>

- De Clercq, N., Danthine, S., Nguyen, M. T., Gibon, V., & Dewettinck, K. (2012). Enzymatic Interesterification of Palm Oil and Fractions: Monitoring the Degree of Interesterification using Different Methods. *Journal of the American Oil Chemists' Society*, 89(2), 219–229. <https://doi.org/10.1007/s11746-011-1905-x>
- Djuricic, I., & Calder, P. C. (2021). Beneficial Outcomes of Omega-6 and Omega-3 Polyunsaturated Fatty Acids on Human Health: An Update for 2021. *Nutrients*, 13(7), 2421. <https://doi.org/10.3390/nu13072421>
- EAS 14:2000. (2000). *East African Standard*. East Africa
- Fadini, A. L., Alvim, I. D., Ribeiro, I. P., Ruzene, L. G., Silva, L. B. D., Queiroz, M. B., Miguel, A. M. R. D. O., Chaves, F. C. M., & Rodrigues, R. A. F. (2018). Innovative strategy based on combined microencapsulation technologies for food application and the influence of wall material composition. *LWT*, 91, 345–352. <https://doi.org/10.1016/j.lwt.2018.01.071>
- Fallahasgari, M., Barzegar, F., Abolghasem, D., & Nayebzadeh, K. (2023). An overview focusing on modification of margarine rheological and textural properties for improving physical quality. *European Food Research and Technology*, 249(9), 2227–2240. <https://doi.org/10.1007/s00217-023-04282-1>
- Food and Nutrition Board, I. of M. (2001). *DIETARY REFERENCE INTAKES FOR Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc*. <https://doi.org/10.17226/5071>.
- Food Safety and Standards Regulations. (2010). *Food Safety and Authority of India*. India
- Gao, Z., Zhu, Y., Jin, J., Jin, Q., & Wang, X. (2023). Chemical–Physical Properties of Red Palm Oils and Their Application in the Manufacture of Aerated Emulsions with Improved Whipping Capabilities. *Foods*, 12(21), 3933. <https://doi.org/10.3390/foods12213933>
- Gao, Z., Zhu, Y., Jin, J., Jin, Q., & Wang, X. (2023). Chemical–Physical Properties of Red Palm Oils and Their Application in the Manufacture of

- Aerated Emulsions with Improved Whipping Capabilities. *Foods*, 12(21), 3933. <https://doi.org/10.3390/foods12213933>
- Gotoh, N., & Wada, S. (2006). The importance of peroxide value in assessing food quality and food safety. *Journal of the American Oil Chemists' Society*, 83(5), 473–474. <https://doi.org/10.1007/s11746-006-1229-4>
- Goyal, A., Tanwar, B., Kumar Sihag, M., & Sharma, V. (2022). Sacha inchi (*Plukenetia volubilis* L.): An emerging source of nutrients, omega-3 fatty acid and phytochemicals. *Food Chemistry*, 373, 131459. <https://doi.org/10.1016/j.foodchem.2021.131459>
- Hamka, H., Saragih, B., Sumarna, D., P. Candra, K., Agustin, S., & Marwati, M. (2024). Review: The Potential for Development of Red Palm Oil Industry in East Kalimantan. *Journal of World Science*, 3(5), 573–586. <https://doi.org/10.58344/jws.v3i5.606>
- Iida, Y. (2025). Transition of *trans* Fatty Acid Contents of Margarines, Fat Spreads and Shortenings in Japan. *Journal of Oleo Science*, 74(4), 341–347. <https://doi.org/10.5650/jos.ess24341>
- Isaksson, T., Nærbø, G., Rukke, E. O., & Sahni, N. S. (2001). In-Line Determination of Moisture in Margarine, Using near Infrared Diffuse Transmittance. *Journal of Near Infrared Spectroscopy*, 9(1), 11–18. <https://doi.org/10.1255/jnirs.289>
- Ismail, A. H., Wongsakul, S., M.R., I-F., A., R., & Mat Yusoff, M. (2020). Physical properties and sensory acceptance of red palm olein-based low-fat ice cream added with guar gum and xanthan gum as stabilizers. *Food Research*, 4(6), 2073–2081. [https://doi.org/10.26656/fr.2017.4\(6\).229](https://doi.org/10.26656/fr.2017.4(6).229)
- Jitpinit, S., Siraworakun, C., Sookklay, Y., & Nuithitikul, K. (2022). Enhancement of omega-3 content in sachu inchi seed oil extracted with supercritical carbon dioxide in semi-continuous process. *Heliyon*, 8(1), e08780. <https://doi.org/10.1016/j.heliyon.2022.e08780>
- Johnson, M. (2014). Omega-3, Omega-6 and Omega-9 Fatty Acids: Implications for Cardiovascular and Other Diseases. *Journal of Glycomics & Lipidomics*, 04(04). <https://doi.org/10.4172/2153-0637.1000123>

- Judd, J. T., Baer, D. J., Clevidence, B. A., Muesing, R. A., Clevidence, B. A., Chen, S. C., Weststrate, J. A., Clevidence, B. A., Meijer, G. W., Janet, W., Lichtenstein, A. H., Montserrat, V.-B., & Schaefer, E. J. (1998). Effects of margarine compared with those of butter on blood lipid profiles related to cardiovascular disease risk factors in normolipemic adults fed controlled diets. *The American Journal of Clinical Nutrition*, *68*(4), 768–777. <https://doi.org/10.1093/ajcn/68.4.768>
- Kadhum, A. A. H., & Shamma, M. N. (2017). Edible lipids modification processes: A review. *Critical Reviews in Food Science and Nutrition*, *57*(1), 48–58. <https://doi.org/10.1080/10408398.2013.848834>
- Khalid, M. U., Shabbir, M. A., Mustafa, S., Hina, S., Quddoos, M. Y., Mahmood, S., Maryam, Y., Faisal, F., & Rafique, A. (2021). Effect of Apple peel as an antioxidant on the quality characteristics and oxidative stability of mayonnaise. *Applied Food Research*, *1*(2), 100023. <https://doi.org/10.1016/j.afres.2021.100023>
- Kim, B. H., Lumor, S. E., & Akoh, C. C. (2008). *Trans* -Free Margarines Prepared with Canola Oil/Palm Stearin/Palm Kernel Oil-Based Structured Lipids. *Journal of Agricultural and Food Chemistry*, *56*(17), 8195–8205. <https://doi.org/10.1021/jf801412v>
- Kodahl, N., & Sørensen, M. (2021). Sacha Inchi (*Plukenetia volubilis* L.) Is an Underutilized Crop with a Great Potential. *Agronomy*, *11*(6), 1066. <https://doi.org/10.3390/agronomy11061066>
- Kong, Y., Guo, R., Xiong, J., Li, P., Ma, C., He, Y., & Huang, Q. (2025). Yeast protein as a sustainable fat replacer in reduced-fat mayonnaise: Impact on rheological properties, emulsion stability, and microstructure. *Food Chemistry*, *493*, 145729. <https://doi.org/10.1016/j.foodchem.2025.145729>
- Kowalska, M., Krzton-Maziopa, A., Zbikowska, A., & Tarnowska, K. (n.d.). *Rheological Properties and Physical Stability of o/w Emulsions Stabilized by Diacylglycerols Formed during Enzymatic Interesterification*.
- Kowalska, M., Żbikowska, A., & Kowalski, B. (2014). Enzymatically Modified Fats Based on Mutton Tallow and Rapeseed Oil Suitable for Fatty

- Emulsions. *Journal of the American Oil Chemists' Society*, 91(10), 1703–1710. <https://doi.org/10.1007/s11746-014-2512-4>
- Lakum, R., & Sonwai, S. (2018). Production of trans-free margarine fat by enzymatic interesterification of soy bean oil, palm stearin and coconut stearin blend. *International Journal of Food Science & Technology*, 53(12), 2761–2769. <https://doi.org/10.1111/ijfs.13888>
- Larqu e, E., Garaulet, M., P erez-Llamas, F., Zamora, S., & Tebar, F. J. (2003). Fatty acid composition and nutritional relevance of most widely consumed margarines in Spain. *Grasas y Aceites*, 54(1), 65–70. <https://doi.org/10.3989/gya.2003.v54.i1.279>
- Li, N., Jia, M., Deng, Q., Wang, Z., Huang, F., Hou, H., & Xu, T. (2021). Effect of low-ratio n-6/n-3 PUFA on blood lipid level: A meta-analysis. *Hormones*, 20(4), 697–706. <https://doi.org/10.1007/s42000-020-00248-0>
- Loganathan, R., Subramaniam, K. M., Radhakrishnan, A. K., Choo, Y.-M., & Teng, K.-T. (2017). Health-promoting effects of red palm oil: Evidence from animal and human studies. *Nutrition Reviews*, 75(2), 98–113. <https://doi.org/10.1093/nutrit/nuw054>
- Lourith, N., Kanlayavattanakul, M., & Chaikul, P. (2024). Sacha Inchi: The Promising Source of Functional Oil for Anti-Aging Product. *Journal of Oleo Science*, 73(4), 429–435. <https://doi.org/10.5650/jos.ess23147>
- Luterotti, S., Bicanic, D., & Po zgaj, R. (2006). New simple spectrophotometric assay of total carotenes in margarines. *Analytica Chimica Acta*, 573–574, 466–473. <https://doi.org/10.1016/j.aca.2006.04.017>
- Marpaung, L., & Sinaga, R. M. (2023). Analysis of Fatty Acid Composition Using GC-MS Method and Antibacterial Activity Test of n-Hexane Extract from Petai Seeds (*Parkia speciosa* Hassk.). *Journal of Chemical Natural Resources*, 4(2), 153–166. <https://doi.org/10.32734/jcnar.v4i2.11973>
- Medina-Mendoza, M., Rodriguez-P erez, R. J., Rojas-Ocampo, E., Torrej on-Valqui, L., Fern andez-Jeri, A. B., Idrogo-V asquez, G., Cayo-Colca, I. S., & Castro-Alayo, E. M. (2021). Rheological, bioactive properties and sensory preferences of dark chocolates with partial

- incorporation of Sacha Inchi (*Plukenetia volubilis* L.) oil. *Heliyon*, 7(2), e06154. <https://doi.org/10.1016/j.heliyon.2021.e06154>
- Miskandar, M. S., Man, Y. C., Yusoff, M. S. A., & Rahman, R. A. (2005). *Quality of margarine: Fats selection and processing parameters*.
- Oliveira, P. D., Rodrigues, A. M. C., Bezerra, C. V., & Silva, L. H. M. (2017). Chemical interesterification of blends with palm stearin and patawa oil. *Food Chemistry*, 215, 369–376. <https://doi.org/10.1016/j.foodchem.2016.07.165>
- Osawa, C. C., Gonçalves, L. A. G., & Ragazzi, S. (2007). Correlation between free fatty acids of vegetable oils evaluated by rapid tests and by the official method. *Journal of Food Composition and Analysis*, 20(6), 523–528. <https://doi.org/10.1016/j.jfca.2007.02.002>
- Pădureț, S. (2022). The Quantification of Fatty Acids, Color, and Textural Properties of Locally Produced Bakery Margarine. *Applied Sciences*, 12(3), 1731. <https://doi.org/10.3390/app12031731>
- Pamungkas, A. Y. D., Putra, Y. A. S., & Wulandari, D. (n.d.). *Bioactive Compound and Fatty Acid Profile Analysis of Cold-pressed Flavor Oil*.
- Perez-Santana, M., Cagampang, G. B., Nieves, C., Cedeño, V., & MacIntosh, A. J. (2022). Use of High Oleic Palm Oils in Fluid Shortenings and Effect on Physical Properties of Cookies. *Foods*, 11(18), 2793. <https://doi.org/10.3390/foods11182793>
- Puprasit, K., Wongsawaeng, D., Ngaosuwan, K., Kiatkittipong, W., & Assabumrungrat, S. (2022). Improved hydrogenation process for margarine production with no trans fatty acid formation by non-thermal plasma with needle-in-tube configuration. *Journal of Food Engineering*, 334, 111167. <https://doi.org/10.1016/j.jfoodeng.2022.111167>
- Purnama, K. O., Setyaningsih, D., Hambali, E., & Taniwiryono, D. (2020). Processing, Characteristics, and Potential Application of Red Palm Oil—A review. *International Journal of Oil Palm*, 3(2), 40–55. <https://doi.org/10.35876/ijop.v3i2.47>
- Purnama, K. O., Setyaningsih, D., Hambali, E., & Taniwiryono, D. (2020). Processing, Characteristics, and Potential Application of Red Palm Oil—A

- review. *International Journal of Oil Palm*, 3(2), 40–55.  
<https://doi.org/10.35876/ijop.v3i2.47>
- Rader, J. I., Weaver, C. M., Patrascu, L., Ali, L. H., & Angyal, G. (n.d.). *wTocopherol, total vitamin A and total fat in margarines and margarine-like products*.
- Ren, M., Zhu, L., Liang, S., Liu, W., Yang, G., Meng, P., Li, K., Shi, C., Liang, L., & Sun, C. (2025). Improvement of chemical composition, physical properties and crystallization characteristics of palm stearin and rice bran oil blends by enzymatic interesterification: Potential base oils in fast-frozen food. *LWT*, 217, 117421.  
<https://doi.org/10.1016/j.lwt.2025.117421>
- Renwick, A. (2006). Toxicology of Micronutrients: Adverse Effects and Uncertainty. *The Journal of Nutrition*, 136(2), 493S-501S.  
<https://doi.org/10.1093/jn/136.2.493S>
- Rini., Azima, F., Yenrina, R., (2019). CHEMICAL AND PHYSICAL CHARACTERISTICS OF MARGARINE MIXTURE OF COCONUT OIL AND PALM OIL STEARIN ADDED WITH CARROT JUICE. *International Journal of Advanced Research*, 7(11), 308–315.  
<https://doi.org/10.21474/IJAR01/10009>
- Rohmah, M., Rahmadi, A., & Raharjo, S. (2022). Bioaccessibility and antioxidant activity of  $\beta$ -carotene loaded nanostructured lipid carrier (NLC) from binary mixtures of palm stearin and palm olein. *Heliyon*, 8(2), e08913.  
<https://doi.org/10.1016/j.heliyon.2022.e08913>
- Serra, J. J., Fagoaga, C., Mura, J., Sempere-Ferre, F., & Castellano, G. (2024). Effectiveness of natural antioxidants on oxidative stability of margarines. *LWT*, 214, 116997. <https://doi.org/10.1016/j.lwt.2024.116997>
- Shin, J.-A., Akoh, C. C., & Lee, K.-T. (2010). Enzymatic interesterification of anhydrous butterfat with flaxseed oil and palm stearin to produce low-trans spreadable fat. *Food Chemistry*, 120(1), 1–9.  
<https://doi.org/10.1016/j.foodchem.2009.09.059>

- Simopoulos, A. P. (2010). The omega-6/omega-3 fatty acid ratio: Health implications. *Oléagineux, Corps Gras, Lipides*, 17(5), 267–275. <https://doi.org/10.1051/ocl.2010.0325>
- Siswanti, Hastuti, P., Supriyanto, & Anandito, R. B. K. (2021). Synthesis of margarine fat from sesame oil and palm stearin by chemical interesterification. *Food Research*, 5(S2), 70–77. [https://doi.org/10.26656/fr.2017.5\(S2\).015](https://doi.org/10.26656/fr.2017.5(S2).015)
- Sitorus, S., Parta, I. B. B., & Ruswanto, A. (2023). Pembuatan Margarin dengan Kombinasi Minyak Sawit Merah dan Lemak Cokelat. *BIOFOODTECH: Journal of Bioenergy and Food Technology*, 1(02), 113–123. <https://doi.org/10.55180/biofoodtech.v1i02.279>
- Sivakanthan, S., Jayasooriya, A. P., & Madhujith, T. (2019). Optimization of the production of structured lipid by enzymatic interesterification from coconut (*Cocos nucifera*) oil and sesame (*Sesamum indicum*) oil using Response Surface Methodology. *LWT*, 101, 723–730. <https://doi.org/10.1016/j.lwt.2018.11.085>
- SNI 01-3541-2014. (2014). *Syarat Mutu Margarin*. BSN. Jakarta.
- Speranza, P., Badan Ribeiro, A. P., Cunha, R. L., Macedo, J. A., & Macedo, G. A. (2015). Influence of emulsion droplet size on antimicrobial activity of interesterified Amazonian oils. *LWT - Food Science and Technology*, 60(1), 207–212. <https://doi.org/10.1016/j.lwt.2014.07.022>
- Steele, L., Drummond, E., Nishida, C., Yamamoto, R., Branca, F., Parsons Perez, C., Allemandi, L., Arnanz, L., Schoj, V., Khanchandani, H. S., Bhardwaj, S., Garg, R., Frieden, T. R., & Cobb, L. K. (2024). Ending Trans Fat—The First-Ever Global Elimination Program for a Noncommunicable Disease Risk Factor. *Journal of the American College of Cardiology*, 84(7), 663–674. <https://doi.org/10.1016/j.jacc.2024.04.067>
- Subroto, E., & Nurannisa, R. L. (2020). *The Recent Application Of Palm Stearin In Food Industry: A Review*. 9(02).
- Sulaiman, A. A., Amiruddin, A., Bahrun, A. H., Yuna, K., & Keela, M. (2024). New Challenges and Opportunities of Indonesian Crude Palm Oil in

- International Trade. *Caraka Tani: Journal of Sustainable Agriculture*, 39(1), 94. <https://doi.org/10.20961/carakatani.v39i1.81957>
- Suryana, M. R., Haziman, M. L., Islamawan, P. A., Hari Hariadi, & Dandy Yusuf. (2023). Use of Beta-Carotene Pigment to Improve Food Product Chemical and Sensory Qualities: A Review. *Journal of Functional Food and Nutraceutical*. <https://doi.org/10.33555/jffn.v4i2.92>
- Teh, S. S., Mah, S. H., Lau, H. L. N., Teng, K. T., & Loganathan, R. (2021). Antioxidant Potential of Red Palm-Pressed Mesocarp Olein. *Journal of Oleo Science*, 70(12), 1719–1729. <https://doi.org/10.5650/jos.ess21147>
- Toshtay, K., Auyezov, A., Azat, S., & Busquets, R. (2025). Trans fatty acids and saturated fatty acids in margarines and spreads in Kazakhstan: Study period 2015–2021. *Food Chemistry: X*, 25, 102246. <https://doi.org/10.1016/j.fochx.2025.102246>
- Ulfah, M., & Ruswanto, A. (2016). *KARAKTERISTIK MINYAK CAMPURAN DARI RED PALM OIL DENGAN PALM KERNEL OLEIN*. 36(2).
- Veronika, N. (2022). *Pengaruh Perbandingan Stearin dan Red Palm Oil Terhadap Kualitas Margarin*.
- Viana Da Silva, M., Santos, M. R. C., Alves Silva, I. R., Macedo Viana, E. B., Dos Anjos, D. A., Santos, I. A., Barbosa De Lima, N. G., Wobeto, C., Jorge, N., & Lannes, S. C. D. S. (2022). Synthetic and Natural Antioxidants Used in the Oxidative Stability of Edible Oils: An Overview. *Food Reviews International*, 38(sup1), 349–372. <https://doi.org/10.1080/87559129.2020.1869775>
- Wahono, S. S., Andayani, S. A., Umyati, S., & Purwanto, M. D. (2025). Optimasi Produksi Produk Sacha Inchi Oil dalam Pencapaian Keuntungan Maksimum di IKM Quilla Herbal Indonesia Sejahtera. *Mimbar Agribisnis : Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis*, 11(1), 519. <https://doi.org/10.25157/ma.v11i1.15793>
- Widowati, D., Pangastuti, A., & Ariviani, S. (2024). Production of trans-fat-free margarine prepared using catfish oil and palmstearin with the addition of avocado waste oil for tocopherol enrichment. *Food Research*, 8(3), 172–186. [https://doi.org/10.26656/fr.2017.8\(3\).445](https://doi.org/10.26656/fr.2017.8(3).445)

- Witasari, L. D., Jason, B., Salim, J. S., Pratama, Y., & Nusantoro, B. P. (2025). Enzymatic synthesis of zero-trans structured lipids from red palm oil (Elaeis guineensis) and sachal inchi oil (Plukenetia volubilis) blends. *Food Bioscience*, 69, 106981. <https://doi.org/10.1016/j.fbio.2025.106981>
- World Health Organization, & Brouwer, I. A. (2016). *Effect of trans-fatty acid intake on blood lipids and lipoproteins: A systematic review and meta-regression analysis*. World Health Organization. <https://iris.who.int/handle/10665/246109>
- Wu, X., Wu, S., Ji, M., & Yoong, J. H. (2018). Influence of red palm oil on the physicochemical and sensory qualities of flavouring oil gravy for instant noodles. *RSC Advances*, 8(2), 1148–1158. <https://doi.org/10.1039/C7RA12387F>
- Yang, T., Fruekilde, M., & Xu, X. (2003). Applications of immobilized *Thermomyces lanuginosa* lipase in interesterification. *Journal of the American Oil Chemists' Society*, 80(9), 881–887. <https://doi.org/10.1007/s11746-003-0789-7>
- Yazdi, Z. K., & Alemzadeh, I. (2011). Improvement of palm oil and sunflower oil blends by enzymatic interesterification. *International Journal of Food Science & Technology*, 46(5), 1093–1099. <https://doi.org/10.1111/j.1365-2621.2011.02596.x>
- Young, N., & Wassell, P. (2008). Margarines and Spreads. In G. L. Hasenhuettl & R. W. Hartel (Eds.), *Food Emulsifiers and Their Applications* (pp. 307–326). Springer New York. [https://doi.org/10.1007/978-0-387-75284-6\\_11](https://doi.org/10.1007/978-0-387-75284-6_11)
- Zhang, Z., Ye, J., Lee, W. J., Akoh, C. C., Li, A., & Wang, Y. (2021). Modification of palm-based oil blend via interesterification: Physicochemical properties, crystallization behaviors and oxidative stabilities. *Food Chemistry*, 347, 129070. <https://doi.org/10.1016/j.foodchem.2021.129070>
- Zhao, S.-Q., Hu, J.-N., Zhu, X.-M., Bai, C.-Q., Peng, H.-L., Xiong, H., Hu, J.-W., & Zhao, Q. (2014). Characteristics and Feasibility of *Trans*- Free Plastic Fats through Lipozyme TL IM-Catalyzed Interesterification of Palm

Stearin and *Akebia trifoliata* Variety *Australis* Seed Oil. *Journal of  
Agricultural and Food Chemistry*, 62(14), 3293–3300.

<https://doi.org/10.1021/jf500267e>