

REFERENCES

- Agnesa, O. S., Waluyo, J., Prihatin, J., & Lestari, S. R. (2017). Potensi Buah Merah (*Pandanus conoideus* Lam.) dalam Menurunkan Kadar LDL Darah Tikus Putih. *Bioeksperimen: Jurnal Penelitian Biologi*, 3(1), 48-57.
- Amchova, P., Kotolova, H., & Ruda-Kucerova, J. (2015). Health Safety Issues of Synthetic Food Colorants. *Regulatory Toxicology and Pharmacology*, 73(3), 914-922.
- Bakry, A. M., Abbas, S., Ali, B., Majeed, H., Abouelwafa, M. Y., Mousa, A., & Liang, L. (2016). Microencapsulation of Oils: A Comprehensive Review of Benefits, Techniques, and Applications. *Comprehensive Reviews in Food Science and Food Safety*, 15(1), 143-182.
- Bhatta, S., Stevanovic Janezic, T., & Ratti, C. (2020). Freeze-Drying of Plant-Based Foods. *Foods*, 9(1), 87.
- Branen, A. L., Davidson, P. M., Salminen, S., & Thorngate, J. (2002). *Food Additives* (2nd ed.). New York: Marcel Dekker.
- Budi, I. M., & Paimin, F. R. (2005). Buah Merah. *Jakarta: Penebar Swadaya*, 22-27.
- Carneiro, H. C., Tonon, R. V., Grosso, C. R., & Hubinger, M. D. (2013). Encapsulation Efficiency and Oxidative Stability of Flaxseed Oil Microencapsulated by Spray Drying using Different Combinations of Wall Materials. *Journal of Food Engineering*, 115(4), 443-451.
- Chen, J., Li, F., Li, Z., McClements, D. J., & Xiao, H. (2017). Encapsulation of Carotenoids in Emulsion-based Delivery Systems: Enhancement of β -carotene Water-dispersibility and Chemical Stability. *Food Hydrocolloids*, 69, 49-55.
- Cornacchia, L., & Roos, Y. H. (2011). Stability of β -carotene in Protein-stabilized Oil-in-water Delivery Systems. *Journal of Agricultural and Food Chemistry*, 59(13), 7013-7020.
- Damodaran, S., Parkin, K. L., & Fennema, O. R. (2008). *Fennema's Food Chemistry* (4th ed.). Boca Raton: CRC press.

- Eun, J. B., Maruf, A., Das, P. R., & Nam, S. H. (2020). A Review of Encapsulation of Carotenoids using Spray Drying and Freeze Drying. *Critical Reviews in Food Science and Nutrition*, 60(21), 3547-3572.
- Ferdiansyah, F., Heriyanto, H., Wijaya, C. H., & Limantara, L. (2017). Pengaruh Metode Nanoenkapsulasi terhadap Stabilitas Pigmen Karotenoid dan Umur Simpan Minyak dari Buah Merah (*Pandanus conoideus* L). *agriTECH*, 37(4), 369-376.
- González-Ortega, R., Faieta, M., Di Mattia, C. D., Valbonetti, L., & Pittia, P. (2020). Microencapsulation of Olive Leaf Extract by Freeze-drying: Effect of Carrier Composition on Process Efficiency and Technological Properties of the Powders. *Journal of Food Engineering*, 285, 110089.
- Gunawan, I. A., Fujii, R., Maoka, T., Shioi, Y., Kameubun, K. M. B., Limantara, L., & Brotosudarmo, T. H. P. (2020). Carotenoid Composition in Buah Merah (*Pandanus conoideus* Lam.), an Indigenous Red Fruit of the Papua Islands. *Journal of Food Composition and Analysis*, 96, 103722.
- Gupta, S. S., & Ghosh, M. (2015). Synthesis, Characterization, Stability Evaluation and Release Kinetics of Fiber-encapsulated Carotene Nano-capsules. *Grasas y Aceites*, 66(4), 104.
- Hull, P. (2010). *Glucose Syrups: Technology and Applications*. John Wiley & Sons.
- Indrawati, R., Sukowijoyo, H., Wijayanti, R. D. E., & Limantara, L. (2015). Encapsulation of Brown Seaweed Pigment by Freeze Drying: Characterization and Its Stability During Storage. *Procedia chemistry*, 14, 353-360.
- Itle, R. A., & Kabelka, E. A. (2009). Correlation between L* a* b* Color Space Values and Carotenoid Content in Pumpkins and Squash (*Cucurbita* spp.). *HortScience*, 44(3), 633-637.
- Kandlakunta, B., Rajendran, A., & Thingnganing, L. (2008). Carotene Content of Some Common (Cereals, Pulses, Vegetables, Spices and Condiments) and Unconventional Sources of Plant Origin. *Food Chemistry*, 106(1), 85-89.
- Kha, T. C., Nguyen, M. H., Roach, P. D., & Stathopoulos, C. E. (2014). Microencapsulation of Gac Oil by Spray Drying: Optimization of Wall Material Concentration and Oil Load using Response Surface Methodology. *Drying Technology*, 32(4), 385-397.

- Khiong, K., Adhika, O. A., & Chakravitha, M. (2009). Inhibition of NF- κ B Pathway as the Therapeutic Potential of Red Fruit (*Pandanus conoideus* Lam.) in the Treatment of Inflammatory Bowel Disease. *Maranatha Journal of Medicine and Health*, 9(1), 150449.
- Khoo, H. E., Prasad, K. N., Kong, K. W., Jiang, Y., & Ismail, A. (2011). Carotenoids and Their Isomers: Color Pigments in Fruits and Vegetables. *Molecules*, 16(2), 1710-1738.
- Knockaert, G., Lemmens, L., Van Buggenhout, S., Hendrickx, M., & Van Loey, A. (2012). Changes in β -carotene Bioaccessibility and Concentration during Processing of Carrot Puree. *Food Chemistry*, 133(1), 60-67.
- Latowski, D., Szymanska, R., & Strzałka, K. (2014). Carotenoids Involved in Antioxidant System of Chloroplasts. In *Oxidative Damage to Plants* (pp. 289-319). Academic Press.
- Lehto, S., Buchweitz, M., Klimm, A., Straßburger, R., Bechtold, C., & Ulberth, F. (2017). Comparison of Food Colour Regulations in the EU and the US: A Review of Current Provisions. *Food Additives & Contaminants: Part A*, 34(3), 335-355.
- Li, K., Pan, B., Ma, L., Miao, S., & Ji, J. (2020). Effect of Dextrose Equivalent on Maltodextrin/Whey Protein Spray-Dried Powder Microcapsules and Dynamic Release of Loaded Flavor during Storage and Powder Rehydration. *Foods*, 9(12), 1878.
- Limbongan, J., & Malik, A. (2009). Peluang Pengembangan Buah Merah (*Pandanus conoideus* Lamk.) di Provinsi Papua. *Jurnal Litbang Pertanian*, 28(4), 134-141.
- Lubis, E. H., Wijaya, H., & Lestari, N. (2012). Mempelajari Ekstraksi dan Stabilitas Total Karotenoid, α - dan β -cryptoxanthin dalam Ekstrak Buah Merah (*Pandanus conoideus* Lamk). *Jurnal Riset Teknologi Industri*, 6(12), 126-140.
- Maoka, T. (2020). Carotenoids as Natural Functional Pigments. *Journal of Natural Medicines*, 74(1), 1-16.
- Meléndez-Martínez, A. J., Britton, G., Vicario, I. M., & Heredia, F. J. (2007). Relationship between the Colour and the Chemical Structure of Carotenoid Pigments. *Food Chemistry*, 101(3), 1145-1150.

- Mohamad, M. F., Dailin, D. J., Gomaa, S. E., Nurjayadi, M., & El Enshasy, H. (2019). Natural Colorant for Food: A Healthy Alternative. *Int J Sci Technol Res*, *8*, 3161-3166.
- Mohammed, N. K., Tan, C. P., Manap, Y. A., Muhiadin, B. J., & Hussin, A. S. M. (2020). Spray Drying for the Encapsulation of Oils—A Review. *Molecules*, *25*(17), 3873.
- Mordi, R. C., Ademosun, O. T., Ajanaku, C. O., Olanrewaju, I. O., & Walton, J. C. (2020). Free Radical Mediated Oxidative Degradation of Carotenes and Xanthophylls. *Molecules*, *25*(5), 1038.
- Murtiningrum, M., Sarungallo, Z. L., & Mawikere, N. L. (2012). The Exploration and Diversity of Red Fruit (*Pandanus conoideus* L.) from Papua Based on Its Physical Characteristics and Chemical Composition. *Biodiversitas Journal of Biological Diversity*, *13*(3), 124-129.
- Nielsen, S. (2010). *Food Analysis Laboratory Manual* (4th ed.). Boston, MA: Springer US.
- Nireesha, G. R., Divya, L., Sowmya, C., Venkateshan, N. N. B. M., & Lavakumar, V. (2013). Lyophilization/Freeze drying-An Review. *International Journal of Novel Trends in Pharmaceutical Sciences*, *3*(4), 87-98.
- Ogrodowska, D., Tanska, M., Brandt, W., & Czaplicki, S. (2020). Impact of The Encapsulation Process by Spray- and Freeze-Drying on The Properties and Composition of Powders obtained from Cold-Pressed Seed Oils with Various Unsaturated Fatty Acids. *Polish Journal of Food and Nutrition Sciences*, *70*(3).
- Okafor, S. N., Obonga, W., Ezeokonkwo, M. A., Nurudeen, J., Orovwigho, U., & Ahiabuikwe, J. (2016). Assessment of the Health implications of Synthetic and Natural Food Colourants: A Critical Review. *UK Journal of Pharmaceutical and Biosciences*, *4*(4), 1-11.
- Özbek, Z. A., & Ergönül, P. G. (2020). Optimisation of Wall Material Composition of Freeze-Dried Pumpkin Seed Oil Microcapsules: Interaction Effects of Whey Protein, Maltodextrin, and Gum Arabic by D-Optimal Mixture Design Approach. *Food Hydrocolloids*, *107*, 105909.
- Pace, C., Trevino, S., Prabhakaran, E., & Scholtz, J. (2004). Protein Structure, Stability and Solubility in Water and Other Solvents. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, *359*(1448), 1225-1235.

- Rodríguez-Huezo, M. E., Pedroza-Islas, R., Prado-Barragán, L. A., Beristain, C. I., & Vernon-Carter, E. J. (2006). Microencapsulation by Spray Drying of Multiple Emulsions Containing Carotenoids. *Journal of Food Science*, 69(7), 351–359.
- Rodriguez-Amaya, D. B. (2001). A Guide to Carotenoid Analysis in Foods. Washington ,DC, USA: OMNI Research, ILSI Human Nutrition Institute.
- Rodríguez-Pulido, F. J., Gómez-Robledo, L., Melgosa, M., Gordillo, B., González-Miret, M. L., & Heredia, F. J. (2012). Ripeness Estimation of Grape Berries and Seeds by Image Analysis. *Computers and Electronics in Agriculture*, 82, 128-133.
- Saini, R. K., & Keum, Y. S. (2018). Carotenoid Extraction Methods: A Review of Recent Developments. *Food chemistry*, 240, 90-103.
- Sarungallo, Z. L., Hariyadi, P., Andarwulan, N., Purnomo, E. H., & Wada, M. (2015). Analysis of α -cryptoxanthin, β -cryptoxanthin, α -carotene, and β -carotene of *Pandanus conoideus* Oil by High-Performance Liquid Chromatography (HPLC). *Procedia Food Science*, 3, 231-243.
- Sarungallo, Z. L., Santoso, B., Murtiningrum, M., Roreng, M. K., & Murni, V. (2019). Karakteristik Mutu Mikroenkapsulat Minyak Buah Merah (*Pandanus conoideus*) dengan Perbandingan Konsentrasi Bahan Pengemulsi dan Bahan Pelapis. *Pro Food*, 5(2), 528-540.
- Šeregelj, V. N., Četković, G. S., Čanadanović-Brunet, J. M., Tumbas-Šaponjac, V. T., Vulić, J. J., & Stajčić, S. S. (2017). Extraction and Encapsulation of Bioactive Compounds from Carrots. *Acta Periodica Technologica*, (48), 261-273.
- Šeregelj, V., Četković, G., Čanadanović-Brunet, J., Šaponjac, V. T., Vulić, J., Lević, S., ... & Hidalgo, A. (2020a). Encapsulation of Carrot Waste Extract by Freeze and Spray Drying Techniques: An Optimization Study. *LWT*, 110696.
- Šeregelj, V., Četković, G., Čanadanović-Brunet, J., Šaponjac, V. T., Vulić, J., & Stajčić, S. (2020b). Encapsulation and Degradation Kinetics of Bioactive Compounds from Sweet Potato Peel During Storage. *Food Technology & Biotechnology*, 58(3).

- Sianipar, F. R. D. N. (2016). Morphological and Anatomical Structure of Red Fruit (*Pandanus Conoideus* Lam.). *KnE Social Sciences*, 37-43.
- Sedgwick, P. (2014). Spearman's Rank Correlation Coefficient. *Bmj*, 349.
- Šturm, L., Črnivec, I. G. O., Istenič, K., Ota, A., Megušar, P., Slukan, A., ... & Ulrih, N. P. (2019). Encapsulation of Non-dewaxed Propolis by Freeze-drying and Spray-drying using Gum Arabic, Maltodextrin and Inulin as Coating Materials. *Food and Bioproducts Processing*, 116, 196-211.
- Surono, I. S., Nishigaki, T., Endaryanto, A., & Waspodo, P. (2008). Indonesian Biodiversities, from Microbes to Herbal Plants as Potential Functional Foods. *信州大学農学部紀要*, 44(1), 23-27.
- Takeiti, C. Y., Kieckbusch, T. G., & Collares-Queiroz, F. P. (2010). Morphological and Physicochemical Characterization of Commercial Maltodextrins with Different Degrees of Dextrose-equivalent. *International Journal of Food Properties*, 13(2), 411-425.
- Tang, C. H., & Li, X. R. (2013). Microencapsulation Properties of Soy Protein Isolate and Storage Stability of the Correspondingly Spray-dried Emulsions. *Food Research International*, 52(1), 419-428.
- Tarlak, F., Ozdemir, M., & Melikoglu, M. (2016). Computer Vision System Approach in Colour Measurements of Foods: Part II. Validation of Methodology with Real Foods. *Food Science and Technology*, 36(3), 499-504.
- Valentina, V., Pratiwi, R. A., Hsiao, P. Y., Tseng, H. T., Hsieh, J. F., & Chen, C. C. (2016). Sensorial Characterization of Foods Before and After Freeze-drying. *Austin Food Sciences*, 1(6), 1-5.
- Wawo, A. H., Lestari, P., & Setyowati, N. (2019). Buah Merah (*Pandanus conoideus* Lamk) *Bioresources* Pegunungan Tengah Papua: Keanekaragaman dan Upaya Konservasinya. *Jurnal Biologi Indonesia*, 15(1), 107-121.
- Winarto, M. M., & Anisah, N. (2009). The Effect of *Pandanus conoideus* Lam. Oil on Pancreatic β -cells and Glibenclamide Hypoglycemic Effect of Diabetic Wistar Rats. *Berkala Ilmu Kedokteran*, 41, 11-19
- Yam, K. L., & Papadakis, S. E. (2004). A Simple Digital Imaging Method for Measuring and Analyzing Color of Food Surfaces. *Journal of Food Engineering*, 61(1), 137-142.

- Yan, X. (2017). Short-Chain Polysaccharide Analysis in Ethanol–Water Solutions. *Journal of AOAC International*, 100(4), 1134-1136.
- Yanuwar, W., Widjanarko, S. B., & Wahono, T. (2007). Karakteristik dan Stabilitas Antioksidan Mikrokapsul Minyak Buah Merah (*Pandanus conoideus* Lam) dengan Bahan Penyalut Berbasis Protein. *Jurnal Teknologi Pertanian*, 8(2), 127-135.
- Yazicioglu, B., Sahin, S., & Sumnu, G. (2015). Microencapsulation of Wheat Germ Oil. *Journal of Good Science and Technology*, 52(6), 3590-3597.
- Yuhono, J. T., & Pribadi, E. R. (2016). Analisis Titik Impas Harga dan Sistim Pemasaran pada Industri Minyak Buah Merah (*Pandanus conoideus* LamK). *Buletin Penelitian Tanaman Rempah dan Obat*, 18(2), 188-202.