

Daftar Pustaka

- Albano, K. M., Cavallieri, Â. L. F. & Nicoletti, V. R., 2019. Electrostatic interaction between proteins and polysaccharides: Physicochemical aspects and applications in emulsion stabilization. *Food Reviews International*, 35(1), pp. 54-89.
- Amrih, D., Hidayat, C. & Hastuti, P., 2017. Kinetic Degradation of Myristicin, Elemicin, and Safrole in Encapsulated Banda Nutmeg (*Myristica fragrans* Houtt) Oleoresin. *Indonesian Food and Nutrition Progress*, 14(1), pp. 44-51.
- Anandharamakrishnan, C. & Ishwarya, S. P., 2015. *Spray drying techniques for food ingredient encapsulation*. s.l.:Wiley & Sons, Ltd..
- Assadpour, E. & Jafari, S. M., 2019. Advances in Spray-Drying Encapsulation of Food Bioactive Ingredients: From Microcapsules to Nanocapsules. *Annual Review of Food Science and Technology*, 1(1), pp. 8.1-8.29.
- Assagaf, M., Hastuti, P., Hidayat, C. & Supriyadi, 2012. Perbandingan ekstraksi oleoresin biji pala (*Myristica fragrans* houtt) asal Maluku Utara menggunakan metode maserasi dan gabungan distilasi-maserasi. *AGRITECH*, 32(3), p. 240.
- Augustin, M. A., Sanguansari, L. & Bode, O., 2006. Maillard reaction products as encapsulants for fish oil powders. *Journal Food Science*, Volume 71, pp. 25-32.
- Badan Standardisasi Nasional, 2010. *SNI 7599-2010: Maltodekstrin*, Jakarta: BSN.
- Bae, E. K. & Lee, S. J., 2008. Microencapsulation of avocado oil by spray drying using whey protein and maltodextrin. *Journal of Microencapsulation*, 25(8), pp. 549-560.
- Baranauskienė, R., Bylaitė, E., Juratė, Ž. & Venskutonis, R. P., 2007. Flavor retention of peppermint (*Mentha piperita* L.) essential oil spray-dried in modified starches during encapsulation and storage. *Journal of Agricultural and Food Chemistry*, 55(8), pp. 3027-3036.
- Botrel, A. D. et al., 2012. Evaluation of spray drying conditions on properties of microencapsulated oregano essential oil. *International Journal of Food Science and Technology*, 47(11), pp. 2289-2296.
- Busch, V. M. et al., 2016. Propolis encapsulation by spray drying: characterization and stability. *LWT - Food Science and Technology*.

Bustaman, S., 2008. prospek pengembangan minyak pala banda sebagai komoditas. *Penelitian dan Pengembangan Pertanian*, 27(3), pp. 93-98.

Calo, J. R., Crandall, P. G., O'Bryan, C. A. & Ricke, S. C., 2015. Essential oils as antimicrobials in food systems - A review. *Food Control*, 54(1), pp. 111-119.

Carmo, E. L. d. et al., 2018. Stability of spray-dried beetroot extract using oligosaccharides and whey proteins. *Food Chemistry*, Volume 249, pp. 51-59.

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), pp. 443-451.

Chang, Y. V. G., Chang, L. S. & Pui, L. P., 2020. Effects of maltodextrin concentration and inlet temperature on the physicochemical properties of spray-dried kuini powder. *Asia-Pacific Journal of Molecular Biology and Biotechnology*, 28(4), pp. 117-131.

Chang, Y. V. G., Chang, L. S. & Pui, L. P., 2020. Effects of maltodextrin concentration and inlet temperature on the physicochemical properties of spray-dried kuini powder. *Asia-Pacific Journal of Molecular Biology and Biotechnology*, 28(4), pp. 117-131.

Chatterjee, D. & Bhattacharjee, P., 2013. Comparative evaluation of the antioxidant efficacy of encapsulated and un-encapsulated eugenol-rich clove extracts in soy bean oil: shelf-life and frying stability of soybean oil. *Journal of Food Engineering*, 117(4), pp. 545-550.

Chen, F.-P., Liu, L.-L. & Tang, C.-H., 2020. Spray-drying microencapsulation of curcumin nanocomplexes with soy protein isolate: Encapsulation, water dispersion, bioaccessibility, and bioactivities of curcumin. *Food Hydrocolloids*, Volume 105.

Chuaychan, S. & Benjakul, S., 2016. Effect of Maltodextrin on Characteristics and antioxidative activity of spray-dried powder of gelatin and gelatin hydrolysate from scale of spotted golden goatfish. *Journal Food Science Technology*, 53(9), pp. 3583-3592.

Codex Alimentarius Commission, 2019. *CODEX STAN 175-1989: General Standard for Soy Protein Products*, Rome: FAO.

Committee on Food Chemical Codex, 2004. *Food Chemical Codex*. 5th penyunt. Washington, D.C.: The National Academic Press.

Correia-Filho, L. C., Lourenço, M. M., Moldão-Martins, M. & Alves, V. D., 2019. Microencapsulation of β -Carotene by Spray Drying: Effect of Wall Material Concentration and Drying Inlet Temperature. *International Journal of Food Science*, 2019(1), pp. 1-12.

da Veiga, R. D. S., da Silvia-Buzanello, R. A., Corso, M. P. & Canan, C., 2019. Essential oils microencapsulated obtained by spray drying: a review. *Journal of Essential Oil Research*, 31(6), pp. 457-473.

Delgado-González, M. J., Carmona-Jiménez, Y., Rodríguez-Dodero, M. C. & García-Moreno, M. V., 2018. Color Space Mathematical Modeling Using Microsoft Excel. *Journal of Chemical Education*, Issue 95, pp. 1885-1889.

Deng, X.-X. et al., 2014. Spray-drying microencapsulation of beta-carotene by soy protein isolate and/or OSA-modified starch. *Journal of Applied Polymer Science*.

Djiuardi, E., Fardiaz, D. & Purwadaria, H. K., 2018. Stability and characteristics of encapsulated nutmeg essential oil as flavor ingredient. *Acta Horticulturae*, 1213(1), pp. 41-47.

Dokic, P., Jakovljevic, J. & Dokic-Baucal, L., 1998. Molecular characteristics of maltodextrin and rheological behaviour of diluted and concentrated solutions. *Colloids and Surfaces*, 141(1998), pp. 435-440.

Early, R., 2015. Milk concentrates and mil powders. Dalam: C. Anandharamakrishnan & S. P. Ishwarya, penyunt. *Spray Drying Techniques for Food Ingredient Encapsulation*. Sussex, UK: John Wiley & Sons, Ltd, pp. 1-36.

Edris, A. E., 2009. Nanoencapsulation of Essential Oils: Potential Application in Food Preservation and in the Perfumes Industry. In: F. Chemat, ed. *Essential Oils and Aromas: Green Extractions and Applications*. New Delhi: Har Krishan Balla & Sons, pp. 184-193.

Ezhilarasi, P. N., Karthik, P., Chhanwal, N. & Anandharamakrishnan, C., 2013. Nanoencapsulation Techniques for Food Bioactive Components: A Review. *Food and Bioprocess Technology*, 6(3), pp. 628-647.

- Fernandes, R. V. D. B., Borges, S. V. & Botrel, D. A., 2014. Gum arabic/starch/maltodextrin/inulin as wall materials on the microencapsulation of rosemary essential oil. *Carbohydrate Polymers*, Volume 101, pp. 524-532.
- Fernandes, R. V. d. B. et al., 2016. Study of ultrasound-assisted emulsions on microencapsulation of ginger essential oil by spray drying. *Industrial Crops and Products*, Volume 94, pp. 413-423.
- Francisco, C. R. L. et al., 2020. Plant proteins at low concentrations as natural emulsifiers for an effective orange essential oil microencapsulation by spray drying. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 607(1), pp. 1-15.
- Frascareli, E. C., Silva, V. M., Tonon, R. V. & Hubinger, M. D., 2012. Effect of process conditions on the microencapsulation of coffee oil by spray drying. *Food and Bioproducts Processing*, Issue 90, pp. 413-424.
- Geranpour, M., Assadpour, E. & Jafari, S. M., 2020. Recent advances in the spray drying encapsulation of essential fatty acids and functional oils. *Trends in Food Science and Technology*, 102(1), pp. 71-90.
- Gharsallaoui, A. et al., 2007. Applications of spray-drying in microencapsulation of food ingredients: An overview. *Food Research International*, 40(9), pp. 1107-1121.
- Huang, L., Ding, X., Li, Y. & Ma, H., 2019. The aggregation, structures and emulsifying properties of soybean protein isolate induced by ultrasound and acid. *Food Chemistry*, 279(1), pp. 114-119.
- Jafari, S. M., 2017. An overview of nanoencapsulation techniques and their classification. In: S. M. Jafari, ed. *Nanoencapsulation Technologies for the Food and Nutraceutical Industries*. Oxford: Elsevier, pp. 2-34.
- Jafari, S. M., Assadpour, E., He, Y. & Bhandari, B., 2008. Encapsulation efficiency of food flavours and oils during spray drying. *Drying Technology*, 26(7), pp. 816-835.
- Jafari, S. M., He, Y. & Bhandari, B., 2007. Encapsulation of Nanoparticles of d-Limonene by Spray-Drying: Role of Emulsifier and Emulsifying Techniques. *Drying Technology*, 25(6), pp. 1069-1079.

- Kenyon, M. M., 1995. Modified Starch, Maltodextrin, and Corn Syrup Solids as Wall Materials for Food Encapsulation. In: J. M. Lakkis, ed. *Encapsulation and Controlled Release of Food Ingredients*. London: Wiley-Blackwell, pp. 42-50.
- Khan, R. A., Rashid Khan, M., Sahreen, S. & Ahmed, M., 2012. Assessment of flavonoids contents and in vitro antioxidant activity of *Launaea procumbens*. *Chemistry Central*, 6(43), pp. 1-11.
- Kim, J. S. & Lee, Y. S., 2009. Study of Maillard reaction products derived from aqueous model systems with different peptide chain lengths. *Food Chemistry*, Volume 116, pp. 846-853.
- Klein, T., Longhini, R., Bruschi, M. L. & Mello, J. C. P. d., 2015. Microparticles containing guarana extract obtained by spray-drying technique: Development and characterization. *Revista Brasileira de Farmacognosia*, 25(3), pp. 292-300.
- Krishnamoorthy, B. & Rema, J., 2012. Nutmeg and Mace. In: K. V. Peter, ed. *Handbook of Herbs and Spices*. Philadelphia: Woodhead Publishing Ltd., pp. 399-412.
- Latimer Jr., G., 2016. *Official Methods of Analysis of AOAC International - 20th Edition*, Rockville: AOAC International.
- Lia, C. et al., 2015. Encapsulation of tomato oleoresin using soy protein isolate-gum aracia conjugates as emulsifier and coating materials. *Food Hydrocolloids*, 45(1), pp. 301-308.
- Liu, L. et al., 2017. Effect of microencapsulation with the Maillard reaction products of whey proteins and isomaltuligosaccharide on the survival rate of *Lactobacillus rhamnosus* in white brined cheese. *Food Control*, pp. 44-49.
- Li, W. et al., 2016. Modification of soy protein hydrolysates by Maillard reaction: Effects of carbohydrate chain length on structural and interfacial properties. *Colloids and Surfaces: Biointerfaces*, pp. 70-77.
- Matsuno, R. & Adachi, S., 1993. Lipid encapsulation technology - Techniques and applications to food. *Trends in Food Science and Technology*, Issue 4, pp. 256-261.
- Matulyte, I. et al., 2019. GC-MS analysis of the composition of the extracts and essential Oil from *Myristica fragrans* Seeds Using Magnesium Aluminometasilicate as Excipient. *Molecules*, 24(6), pp. 1-12.

- McClements, D. J. & Jafari, S. M., 2018. Improving emulsion formation, stability and performance using mixed emulsifiers: A review. *Advances in Colloid and Interface Science*, 251(1), pp. 55-79.
- Mohapatra, D. et al., 2010. Postharvest Hardness and Color Evolution of White Button Mushrooms (*Agaricus bisporus*). *Journal of Food Science*, 75(3), pp. 146-152.
- Moser, P., Souza, R. T. D. S. & Telis, V. R. N., 2017. Spray drying of grape juice from Hybrid Cv. Brs Violeta: microencapsulation of anthocyanins using protein/maltodextrin blends as drying aids. *Journal Food Process and Preservation*, Volume 41.
- Nielsen, S. S., 2006. Proximate Assays in Food Analysis. Dalam: *Encyclopedia of Analytical Chemistry*. s.l.:John Wiley & Sons, Ltd., pp. 1-8.
- Nishinari, K., Fang, Y., Guo, S. & Phillips, G., 2014. Soy proteins: A review on composition, aggregation, and emulsification. *Food Hydrocolloids*, pp. 301-318.
- Nunes, G. L. et al., 2014. Microencapsulation of freeze concentrated *Ilex paraguariensis* extract by spray drying. *Journal of Food Engineering*, Volume 151, pp. 60-68.
- Nurdjannah, N., 2007. *Teknologi pengolahan pala*, Jakarta: Balai Penelitian dan Pengembangan Pertanian.
- Pan, L.-H. et al., 2022. Microencapsulation of blueberry anthocyanins by spray drying with soy protein isolates/high methyl pectin combination: Physicochemical properties, release behavior in vitro and storage stability. *Food Chemistry*, Volume 395.
- Pathare, P. B., Opara, U. L. & Al-Said, F. A. J., 2013. Colour Measurement and Analysis in Fresh and Processed Foods: A Review. *Food and Bioprocess Technology*, 6(1), pp. 36-60.
- Pereira, A. R. L., Cattelan, M. G. & Nicoletti, V. R., 2019. Microencapsulation of pink pepper essential oil: properties of spray-dried pectin/SPI, double layer versus SPI single layer stabilized emulsions. *Colloids and Surfaces A*, Volume 581.
- Prata, A. S., Garcia, L., Tonon, R. V. & Hubinger, M. D., 2013. Wall Material Selection for Encapsulation by Spray Drying. *Journal of Colloid Science and Biotechnology*, Issue 2, pp. 1-7.

- Quintanilla-Carvajal, M. X. et al., 2010. Nanoencapsulation: A new trend in food engineering processing. *Food Engineering Reviews*, 2(1), pp. 39-50.
- Raja, K. C. M. et al., 1989. Material characterization studies of maltodextrin samples for the use of wall material. *Starch*, Issue 41, pp. 298-303.
- Rascon, M. P., Beristain, C. I., Garcia, H. S. & Salgado, M. A., 2011. Carotenoid retention and storage stability of spray-dried encapsulated paprika oleoresin using gum arabic and soy protein isolate as wall materials. *LWT - Food Science and Technology*, Volume 44, pp. 549-557.
- Rauf, R., 2015. *Kimia Pangan*. I penyunt. Yogyakarta: ANDI Yogyakarta.
- Reineccius, G. A., 2004. The spray drying of food flavors. *Drying Technology*, 22(6), pp. 1289-1324.
- Rismunandar, 1988. *Rempah-Rempah Komoditi Eksport Indonesia*. Bandung: Sinar Baru.
- Riyajan, S. & Sakdapipanich, J. T., 2009. Encapsulated neem extract containing Azadiractin-A within hydrolyzed poly(vinyl acetate) for controlling its release and photodegradation stability. *Chemical Engineering Journal*, 152(3), pp. 591-597.
- Rodianawati, I., Hastuti, P. & Cahyanto, M. N., 2015. *Nutmeg's (*Myristica Fragrans* Houtt) Oleoresin: Effect of Heating to Chemical Compositions and Antifungal Properties*. Online, Elsevier BV, pp. 244-254.
- Rodriguez-Aguilera, R., Oliveira, J. C., Montanez, J. C. & Mahajan, P. V., 2010. Effect of modified atmosphere packaging on quality factors and shelf-life of surface mould ripened cheese. *LWT - Food Science and Technology*, 44(2011), pp. 330-336.
- Seregelj, V. et al., 2021. Encapsulation of carrot waste extract by freeze and spray drying techniques: An optimization study. *LWT - Food Science and Technology*, Issue 138, pp. 1-10.
- Shahidi, F. & Han, X. Q., 1993. Encapsulation of Food Ingredients. *Critical Reviews in Food Science and Nutrition*, 33(6), pp. 501-547.
- Silva, E. K. & Meireles, M. A. A., 2015. Influence of the degree of inulin polymerization on the ultrasound-assisted encapsulation of annatto seed oil. *Carbohydrate Polymer*, Volume 33, pp. 578-586.

- Silva, V. M., Vietra, G. S. & Hubinger, M. D., 2014. Influence of different combination of wall materials and homogenisation pressure on the microencapsulation of green coffee oil by spray drying. *Food Research International*, Volume 61, pp. 132-143.
- Srinavas, D., Vinoda, N. & Edukondalu, L., 2018. Effect of Maltodextrin Concentration on Spray Dried Bitter Gourd Powder. *International Journal of Current Microbiology and Applied Science*, 7(5), pp. 3147-3154.
- Toure, A., Xiaoming, Z., Jia, C. S. & Zhijian, D., 2007. Microencapsulation and oxidative stability of ginger essential oil in Maltodextrin/Whey Protein Isolate (MD/WPI). *International Journal of Dairy Science*, 2(4), pp. 387-392.
- Vladic, J. et al., 2015. Recycling of filter tea industry by-products: Production of *A. millefolium* powder using spray drying technique. *Industrial Crops and Products*, Volume 80, pp. 197-206.
- Wagner, L. A. & Warthesen, J. J., 1995. Stability of Spray-Dried Encapsulated Carrot Carotenes. *Food Science*, 60(5), pp. 1048-1053.
- Wang, T. et al., 2021. Effect of ultrasound on the preparation of soy protein isolate-maltodextrin embedded hemp seed oil microcapsules and the establishment of oxidation kinetics models. *Ultrasonics Sonochemistry*, 77(105700).
- Warner, R. D., 2014. Measurements of Water-holding Capacity and Color: Objective and Subjective. Dalam: C. Devine & M. Dikeman, penyunt. *Encyclopedia of Meat Science*. Oxford: Elsevier, pp. 164-171.
- Zhong, Q. & Jin, M., 2009. Nanoscalar structures of spray-dried zein microcapsules and in vitro release kinetics of the encapsulated lysozyme as affected by formulations. *Journal of Agricultural and Food Chemistry*, 57(9), pp. 3886-3894.
- Zhou, D. et al., 2017. Preparation of walnut oil microcapsules employing soybean protein isolate and maltodextrin with enhanced oxidation stability of walnut oil. *LWT - Food Science and Technology*, 83(1), pp. 292-297.
- Zuidam, N. J. & Shimoni, E., 2010. Overview of microencapsulates for use in food products or processes and methods to make them. In: N. J. Zuidam & V. Nedovic, eds. *Encapsulation Technologies for Active Food Ingredients and Food Processing*. New York: Springer New York, pp. 3-29.