

BIBLIOGRAPHY

- Al-Sheraji, S. H., Ismail, A., Manap, M. Y., Mustafa, S., Yusof, R. M., & Hassan, F. A. (2013). Prebiotics as Functional Foods: A Review. *Journal of Functional Foods*, 5(4), 1542-1553. doi:10.1016/j.jff.2013.08.009
- Amaliah, I., David, W., & Ardiansyah. (2019). Perception Of The Millennial Generation Toward Functional Food in Indonesia. *Journal of Functional Food and Nutraceutical*, 1(1), 31-40. doi:10.33555/jffn.v1i1.11
- Amin, T., Thakur, M., & Jain, S. C. (2013). Microencapsulation-The Future of Probiotic Cultures. *Journal of Microbiology, Biotechnology and Food Sciences*, 3(1), 35-43. Retrieved October 21, 2021, from https://www.researchgate.net/publication/285816578_Microencapsulation_the_future_of_probiotic_cultures
- Ashaolu, T. J. (2020). Immune Boosting Functional Foods and Their Mechanisms: A Critical Evaluation of Probiotics and Prebiotics. *Biomedicine and Pharmacotherapy*, 130. doi:<https://doi.org/10.1016/j.biopha.2020.110625>
- Attri, S., Singh, N., Nadda, A. K., & Goel, G. (2021). Probiotics and Their Potential Applications: An Introduction. In G. Goel, A. Kumar, G. Goel, & A. Kumar (Eds.), *Advances in Probiotics for Sustainable Food and Medicine* (Vol. 21, pp. 1-28). Singapore: Springer Nature Singapore Pte Ltd. Retrieved September 27, 2021
- Barclay, T., Ginic-Markovic, M., Cooper, P., & Petrovsky, N. (2010). Inulin-A Versatile Polysaccharide with Multiple Pharmaceutical and Food Chemical Uses. *Journal of Excipients and Food Chemicals*, 1(3), 27-50. Retrieved January 11, 2022, from https://www.researchgate.net/publication/49597010_Inulin_-_A_versatile_polysaccharide_with_multiple_pharmaceutical_and_food_chemical_uses#:~:text=It%20is%20used%20by%20the,a%20wide%20range%20of%20compounds.
- Capdepon, C., Verheye, I. J., & Stevens, P. (2018). Method and Composition for the Preparation of Gelatin-based Gummy Candies. *International Application Published Under The Patent Cooperation Treaty (PCT)*, 1-18. Retrieved February 9, 2021, from <https://patents.google.com/patent/WO2018134365A1/en>

- Chen, W., Dusa, F., Witos, J., Ruokonen, S., & Wiedmer, S. (2018). Determination of the Main Phase Transition Temperature of Phospholipids by Nanoplasmonic Sensing. *Scientific Reports*, 8(1), 1-11. doi:<https://www.nature.com/articles/s41598-018-33107-5>
- Ciurzynska, A., & Lenart, A. (2011). Freeze Drying - Application in Food Processing and Biotechnology - A Review. *Polish Journal of Food and Nutrition Sciences*, 61(3), 165-171. doi:10.2478/v10222-011-0017-5
- Costa, P. J., Rocha-Santos, T., Gomes, A. M., Pintado, M. M., Sousa, S., Amaral, M. H., . . . Freitas, A. C. (2014). Immobilization and Microencapsulation of Probiotics. In J. P. Silva, A. C. Freitas, J. P. Silva, & A. C. Freitas (Eds.), *Probiotic Bacteria: Fundamentals, Therapy, and Technological Aspects* (pp. 171-226). Boca Raton: Taylor & Francis Group, LLC. Retrieved October 5, 2021
- Crowe, J. H., Hoekstra, F. A., & Crowe, L. M. (1989). Membrane Phase Transitions are Responsible for Imbibitional Damage in Dry Pollen. *Proceedings of the National Academy of Sciences*, 86(2), 520-523. doi:<http://dx.doi.org/10.1073/pnas.86.2.520>
- Dalli, S. S., Uprety, B. K., & Rakshit, S. K. (2017). Industrial Production of Active Probiotics for Food Enrichment. In Y. H. Roos, & Y. D. Livney, *Engineering Foods for Bioactives Stability and Delivery* (pp. 85-118). New York: Springer Science+Business Media LLC. Retrieved April 7, 2021
- Das, A., Ray, S., Raychaudhuri, U., & Chakraborty, R. (2014). Microencapsulation of Probiotic Bacteria and Its Potential Application in Food Technology. *International Journal of Agriculture, Environment & Biotechnology*, 6(1), 63-69. doi:<http://dx.doi.org/10.5958/j.2230-732X.7.1.007>
- Davani-Davari, D., Negahdaripour, M., Karimzadeh, I., Seifan, M., Mohkam, M., Masoumi, S. J., . . . Ghasemi, Y. (2019). Prebiotics: Definition, Types, Sources, Mechanisms, and Clinical Applications. *Foods*, 8(3), 92-119. doi:<https://doi.org/10.3390/foods8030092>
- Desnilasari, D., & Lestari, N. P. (2014). Formulasi Minuman Sinbiotik dengan Penambahan Puree Pisang Ambon (*Musa paradisiaca* var *sapientum*) dan Inulin Menggunakan Inokulum *Lactobacillus casei*. *AGRITECH*, 34(3), 257-265. Retrieved October 7, 2021, from <https://media.neliti.com/media/publications/98325-ID-formulasi-minuman-sinbiotik-dengan-penam.pdf>

- Dhewa, T., Pant, S., & Mishra, V. (2011). Development of Freeze Dried Synbiotic Formulation using a Probiotic Strain of *Lactobacillus plantarum*. *Journal of Food Science and Technology*, 51(1), 83-89. doi:10.1007/s13197-011-0457-2
- Dominguez, A. L., Rodrigues, L. R., Lima, N. M., & Teixeira, J. A. (2013). An Overview of the Recent Developments of Fructooligosaccharide Production and Applications. *Food and Bioprocess Technology*, 7(2), 324-337. doi:10.1007/s11947-013-1221-6
- Flach, J., Waal, M. V., Nieuwboer, M. V., Claassen, E., & Larsen, O. (2017). The Underexposed Role of Food Matrices in Probiotic Products: Reviewing the Relationship between Carrier Matrices and Product Parameter. *Critical Review in Food Science and Nutrition*, 58(15), 2570-2584 . doi:https://doi.org/10.1080/10408398.2017.1334624
- Foerst, P., Kulozik, U., Schmitt, M., Bauer, S., & Santivarangkna, C. (2012). Storage Stability of Vacuu-dried Probiotic Bacterium *Lactobacillus paracasei* F19. *Food and Bioprocess Technology*, 90(C2), 1-6. doi:http://dx.doi.org/10.1016/j.fbp.2011.06.004
- Gadhiya, D., Shah, N. P., Patel, A. R., & Prajapati, J. B. (2018). Preparation and Shelf Life Study of Probiotic Chocolate Manufactured Using *Lactobacillus helveticus* MTCC 5463. *Acta Alimentaria*, 47(3), 350-358. doi:10.1556/066.2018.47.3.11
- Gautier, J., Passot, S., Penicaud, C., Guillemin, H., Cenard, S., Lieben, P., & Fonseca, F. (2013). A Low Membrane Lipid Phase Transition Temperature is Associated with a High Cryotolerance of *Lactobacillus delbrueckii* subspecies *bulgaricus* CFL1. *Journal of Dairy Science*, 96(9), 5591-5602. doi:http://dx.doi.org/10.3168/jds.2013-6802
- Goldfein, K. R., & Slavin, J. L. (2015). Why Sugar is Added to Food: Food Science 101. *Comprehensiev Reviews in Food Science and Food Safety*, 14, 644-656. doi:10.1111/1541-4337.12151
- Golovina, E. A., Golovin, A. V., Hoekstra, F. A., & Faller, R. (2009). Water Replacement Hypothesis in Atomic Detail-Factors Determining the Structure of Dehydrated Bilayer Stacks. *Biophysical Journal*, 97(2), 490-499. doi:http://dx.doi.org/10.1016/j.bpj.2009.05.007
- Gueimonde, M., Reyes-Gavilan, C. G., Saez, B., Salazar, N., & Arbolea, S. (2019). Stability of Lactic Acid Bacteria and Bifidobacteria in Foods and Supplements. In G. Vinderola, A. C. Ouweland, S. Salminen, A. Wright, G. Vinderola, A. C.

- Ouwehand, S. Salminen, & A. Wright (Eds.), *Lactic Acid Bacteria: Microbiological and Functional Aspects* (5th ed., pp. 337-354). Boca Raton: Taylor & Francis Group, LLC. Retrieved October 2, 2021
- Guimaraes, J. T., Balthazar, C. F., Silva, R., Rocha, R. S., Graca, J. S., Esmerino, E. A., . . . Cruz, A. G. (2020). Impact of Probiotics and Prebiotics on Food Texture. *Current Opinion in Food Science*, 33, 38-44. doi:<https://doi.org/10.1016/j.cofs.2019.12.002>
- Hartel, R. W., Elbe, J. H., & Hofberger, R. (2018). *Confectionery Science and Technology*. Cham, Switzerland: Springer International Publishing AG. Retrieved October 22, 2021
- Hincha, D. K., Popova, A. V., & Cacela, C. (2006). Effects of Sugars on the Stability and Structure of Lipid Membranes during Drying. In A. L. Liu, & H. T. Tien (Eds.), *Advances in Planar Lipid Bilayers and Liposomes* (Vol. 3, pp. 189-217). San Diego: Elsevier Inc. Retrieved January 11, 2022
- Hossain, M. N., Ranadheera, C. S., Fang, Z., & Ajlouni, S. (2020). Healthy Chocolate Enriched with Probiotics: A Review. *Food Science and Technology*, 1-13. doi:<https://doi.org/10.1590/fst.11420>
- Jiamjariyatam, R. (2018). Influence of Gelatin and Isomaltulose on Gummy Jelly Properties. *International Food Research Journal*, 25(2), 776-783. Retrieved March 15, 2021, from [http://www.ifrj.upm.edu.my/25%20\(02\)%202018/\(46\).pdf](http://www.ifrj.upm.edu.my/25%20(02)%202018/(46).pdf)
- Kahar, A. A., Sharifudin, S. A., Kee, B. B., Aziz, N., & Long, K. (2016). The Effect of Different Freeze Dried Formulations on the Viability of Lactic Acid Bacteria in Lactose-Free Yogurt Production. *Australian Journal of Basic and Applied Sciences*, 10(17), 164-171. Retrieved October 20, 2021, from https://www.researchgate.net/publication/315711535_The_Effect_of_Different_Freeze_Dried_Formulations_on_The_Viability_of_Lactic_Acid_Bacteria_In_Lactose-Free_Yogurt_Production
- Kusnadi, J., & Pratiwi, K. C. (2013). Pertumbuhan Bakteri Probiotik (Bifidobacterium bifidum dan Lactobacillus plantarum) dalam Medium Campuran Tepung Talas (Colocasia esculenta L. Schott var. Boring) dan Kedelai Bubuk. *NATURAL B*, 2(1), 81-87. Retrieved October 9, 2021, from <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiHqbCikOryAhWCqksFHQBDAzAQFnoECAIQAQ&url=https%3A%2F%2Fnatural-b.ub.ac.id%2Findex.php%2Fnatural->

b%2Farticle%2FdownloadSuppFile%2F200%2F76&usg=AOvVaw16WPq4ItYU9IikJX2_

- Lapsiri, W., Bhandari, B., & Wanchaitanawong, P. (2012). Viability of *Lactobacillus plantarum* TISTR 2075 in Different Protectants during Spray Drying and Storage. *Drying Technology: An International Journal*, 30(13), 1407-1412. doi:http://dx.doi.org/10.1080/07373937.2012.684226
- Lele, V., Ruzauskas, M., Zavistanaviciute, P., Laurusiene, R., Rimene, G., Kiudulaite, D., . . . Bartkiene, E. (2018). Development and Characterization of the Gummy-supplements, Enriched with Probiotics and Prebiotics. *CyTA-Journal of Food*, 16(1), 580-587. doi:https://doi.org/10.1080/19476337.2018.1433721
- Lestari, L. A., Kusuma, W. I., Nurhayati, F., Kusuma, R. J., & Erwanto, Y. (2020). The Viability of Probiotic *Lactobacillus acidophilus* IFO 13951 and *Bifidobacterium longum* ATCC 15707 in Gummy Candies Decreased during 4 Weeks of Storage. *Food Research*, 4(4), 1191-1195. doi:https://doi.org/10.26656/fr.2017.4(4).078
- Li, C., Li-ying, N., Da-jing, L., Chun-quan, L., Ying-ping, L., Chun-ju, L., & Jiang-feng, S. (2018). Effects of Different Drying Methods on Quality, Bacterial Viability, and Storage Stability of Probiotic Enriched Apple Snacks. *Journal of Integrative Agriculture*, 17(1), 247-255. doi:https://doi.org/10.1016/S2095-3119(17)61742-8
- Liu, Y., Zhang, Z., & Hu, L. (2021). High Efficient Freeze-drying Technology in Food Industry. *Critical Reviews in Food Science and Nutrition*, 1-19. doi:https://doi.org/10.1080/10408398.2020.1865261
- Lopusiewicz, L., Bogusławska-Was, E., Drozłowska, E., Trocer, P., Dłubała, A., Mazurkiewicz-Zapałowicz, K., & Bartkowiak, A. (2021). The Application of Spray-Dried and Reconstituted Flaxseed Oil Cake Extract as Encapsulating Material and Carrier for Probiotic *Lactobacillus rhamnosus* GG. *Materials*, 14(18), 1-17. doi:https://doi.org/10.3390/ma14185324
- Luca, L., & Oroian, M. (2021). Influence of Different Prebiotics on Viability of *Lactobacillus casei*, *Lactobacillus plantarum* and *Lactobacillus rhamnosus* Encapsulated in Alginate Microcapsules. *Foods*, 10(4), 1-19. doi:https://doi.org/10.3390/foods10040710
- Marini, S. M., Desniar, & Santoso, J. (2016). Karakterisasi Minuman Jelly Probiotik dengan Penambahan *Lactobacillus plantarum* (SK5) asal Bekasam selama

- Penyimpanan. *Jurnal Pengolahan Hasil Perikanan Indonesia*, 19(3), 288-298. doi:<http://dx.doi.org/10.17844/jphpi.v19i3.14535>
- Matouskova, P., Hoova, J., Rysavka, P., & Marova, I. (2021). Stress Effect of Food Matrices on Viability of Probiotic Cells during Model Digestion. *Microorganisms*, 9(8), 1-17. doi:<https://doi.org/10.3390/microorganisms9081625>
- Mennah-Govela, Y. A., & Bornhorst, G. M. (2021). Food Buffering Capacity: Quantification Methods and its Importance in Digestion and Health. *Food & Function*, 12(2), 543-563. doi:10.1039/d0fo02415e
- Mishra, S., & Mishra, H. N. (2012). Technological Aspects of Probiotic Functional Food Development. *Nutrafoods*, 11(4), 117-130. doi:10.1007/s13749-012-0055-6
- Mondhe, S. (2021). A Review on Process of Freeze-Drying Technology. *Food and Agriculture Spectrum Journal*, 2(5), 71-73. Retrieved November 9, 2021, from <https://fasj.org/index.php/fasj/article/view/86>
- Nurainy, F., Rizal, S., Suharyono, S., & Umami, E. (2018). Karakteristik Minuman Probiotik Jambu Biji (*Psidium guajava*) pada Berbagai Variasi Penambahan Sukrosa dan Susu Skim. *Jurnal Aplikasi Teknologi Pangan*, 7(2), 47-54. doi:<https://doi.org/10.17728/jatp.2510>
- Nurhartadi, E., Nursiwi, A., Utami, R., & Widayani, E. (2018). Pengaruh Waktu Inkubasi dan Konsentrasi Sukrosa terhadap Karakteristik Minuman Probiotik dari Whey Hasil Samping Keju. *Jurnal Teknologi Hasil Pertanian*, IX(2), 73-83. Retrieved October 7, 2021, from <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwialu35xLXzAhVYSX0KHaJyAW4QFnoECBYQAQ&url=https%3A%2F%2Fjurnal.uns.ac.id%2Ffilmupangan%2Farticle%2Fdownload%2F29056%2F19738&usg=AOvVaw0FBHA1mgJ8UyhAoeI9tbm8>
- Pandey, K. R., Naik, S. R., & Vakil, B. V. (2015). Probiotics, Prebiotics and Synbiotics- A Review. *Journal of Food Science and Technology*, 52(12), 7577-7587. doi:10.1007/s13197-015-1921-1
- Peredo, A. G., Beristain, C. I., Pascual, L. A., Azuara, E., & Jimenez, M. (2016). The Effect of Prebiotics on the Viability of Encapsulated Probiotic Bacteria. *LWT- Food Science and Technology*, 73, 191-196. doi:<https://doi.org/10.1016/j.lwt.2016.06.021>

- Pielak, M., Czarniecka-Skubina, E., Trafialek, J., & Gluchowski, A. (2019). Contemporary Trends and Habits in the Consumption of Sugar and Sweeteners- A Questionnaire Survey among Poles. *International Journal of Environmental Research and Public Health*, 16(7). doi:<https://doi.org/10.3390/ijerph16071164>
- Putra, R. P. (2020). Potensi Prebiotik Tepung Pisang yang Dimodifikasi Menggunakan Pemanasan Autoklaf Dilanjutkan dengan Retrogradasi. *Jurnal Pendidikan Teknologi Pertanian*, 6(2), 349-360. Retrieved October 10, 2021, from <https://ojs.unm.ac.id/ptp/article/view/14746/8655>
- Rahman, D. H., Tanziha, I., & Usmiati, S. (2012). Formulasi Produk Susu Fermentasi Kering dengan Penambahan Bakteri Probiotik *Lactobacillus casei* dan *Bifidobacterium longum*. *Jurnal Gizi dan Pangan*, 7(1), 49-56. Retrieved October 6, 2021, from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwi_ja37r7XzAhW273MBHVXvB94QFnoECAMQAQ&url=https%3A%2F%2Fjournal.ipb.ac.id%2Findex.php%2Fjgizipangan%2Farticle%2Fdownload%2F5906%2F4579%2F&usg=AOvVaw2cV8hNCbouEpvNiYK8q
- Rama, G. R., Dullius, D., Agnol, W. D., Esquerdo, V. M., Lehn, D. N., & Souza, C. F. (2021). Ricotta Whey Supplemented with Gelatin and Collagen for the Encapsulation of Probiotic Lactic Acid Bacteria. *Food Science and Technology*, 41(3), 576-586. doi:<https://doi.org/10.1590/fst.19720>
- Romano, N., Tymczyszyn, E., Mobili, P., & Gomez-Zavaglia, A. (2016). Prebiotics as Protectants of Lactic Acid Bacteria. In R. R. Watson, V. R. Preedy, R. R. Watson, & V. R. Preedy (Eds.), *Probiotics, Prebiotics, and Synbiotics: Bioactive Foods in Health Promotion* (pp. 155-163). London: Elsevier. Retrieved September 30, 2021
- Santos, G., Nogueira, R. I., & Rosenthal, A. (2018). Powdered Yoghurt Produced by Spray Drying and Freeze Drying: A Review. *Brazilian Journal of Food Technology Campinas*, 21, 1-9. Retrieved November 9, 2021, from <https://www.scielo.br/j/bjft/a/z36wyrYGCXy7xJcy6LZTXsR/?format=pdf&lang=en>
- Sarkar, S. (2020). Spray Drying Encapsulation of Probiotics for Functional Food Formulation-A Review. *Novel Techniques in Nutrition and Food Science*, 5(2), 441-449. doi:<http://dx.doi.org/10.31031/NTNF.2020.05.000610>

- Savedboworn, W., & Wanchaitanawong, P. (2015). Viability and Probiotic Properties of *Lactobacillus plantarum* TISTR 2075 in Spray-dried Fermented Cereal Extracts. *Maejo International Journal of Science and Technology*, 9(3), 382-393. Retrieved October 10, 2021, from <https://www.researchgate.net/publication/289993683>
- Savedboworn, W., Teawsomboonkit, K., Surichay, S., Riansa-ngawong, W., Rittisak, S., Charoen, R., & Phattayakorn, K. (2019). Impact of Protectants on the Storage Stability of Freeze-dried Probiotic *Lactobacillus plantarum*. *Food Science and Biotechnology*, 28(3), 795-805. doi:<https://doi.org/10.1007/s10068-018-0523-x>
- Setiarto, R. H., Widhyastuti, N., & Fairuz, I. (2017). Pengaruh Starter Bakteri Asam Laktat dan Penambahan Tepung Talas Termodifikasi terhadap Kualitas Yoghurt Sinbiotik. *Jurnal Riset Teknologi Industri*, 11(1), 18-30. Retrieved November 6, 2021, from http://ejournal.kemenperin.go.id/jrti/article/view/2179/pdf_4
- Setiarto, R. H., Widhyastuti, N., Saskiawan, I., & Safitri, R. M. (2017). Pengaruh Variasi Konsentrasi Inulin pada Proses Fermentasi oleh *Lactobacillus acidophilus*, *Lactobacillus bulgaricus*, dan *Streptococcus thermophilus*. *BIOPROPAL INDUSTRI*, 8(1), 1-17. Retrieved October 10, 2021, from <https://media.neliti.com/media/publications/53536-ID-none.pdf>
- Silaban, B. J., Nurhayati, L., & Hartanti, A. W. (2020). Viabilitas Probiotik *Lactobacillus acidophilus* DLBSD102 setelah Mikroenkapsulasi. *Jurnal Sains Natural Univesitas Nusa Bangsa*, 10(1), 6-18. doi:10.31938/jsn.v10i1.266
- Talebzadeh, S., & Sharifan, A. (2016). Developing Probiotic Jelly Desserts with *Lactobacillus acidophilus*. *Journal of Food Processing and Preservation*, 1-12. doi:doi:10.1111/jfpp.13026
- Terpou, A., Papadaki, A., Lappa, I. K., Kachrimanidou, V., Bosnea, L. A., & Kopsahelis, N. (2019). Probiotics in Food Systems: Significance and Emerging Strategies Towards Improved Viability and Delivery of Enhanced Beneficial Value. *Nutrients*, 11(7). doi: <https://doi.org/10.3390/nu11071591>
- Valero-Cases, E., & Frutos, M. J. (2015). Effect of Different Types of Encapsulation on the Survival of *Lactobacillus plantarum* during Storage with Inulin and In Vitro Digestion. *Food Science and Technology*, 64(2), 824-828. doi:<http://dx.doi.org/10.1016/j.lwt.2015.06.049>

- Vinayak, A., Mudgal, G., Sharma, S., & Singh, G. B. (2021). Prebiotics for Probiotics. In G. Goel, A. Kumar, G. Goel, & A. Kumar (Eds.), *Advances in Probiotics for Sustainable Food and Medicine* (Vol. 21, pp. 63-82). Singapore: Springer Nature Singapore Pte Ltd. Retrieved September 29, 2021
- Vinderola, G., Champagne, C. P., & Desfosses-Foucault, E. (2019). The Production of Lactic Acid Bacteria Starters and Probiotic Cultures: An Industrial Perspective. In G. Vinderola, A. C. Ouwehand, S. Salminen, A. Wright, G. Vinderola, A. C. Ouwehand, S. Salminen, & A. Wright (Eds.), *Lactic Acid Bacteria: Microbiological and Functional Aspects* (5th ed., pp. 317-336). Boca Raton: Taylor and Francis Group. Retrieved September 30, 2021
- Yilmaz-Ersan, L., Ozcan, T., & Akpınar-Bayizit, A. (2020). Assessment of Socio-demographic Factors, Health Status and the Knowledge on Probiotic Dairy Products. *Food Science and Human Wellness*, 9(3), 272-279. doi:<https://doi.org/10.1016/j.fshw.2020.05.004>
- Yulia, N., Wibowo, A., & Kosasih, E. D. (2020). Karakteristik Minuman Probiotik Sari Ubi Kayu dari Kultur Bakteri *Lactobacillus acidophilus* dan *Streptococcus thermophilus*. *Jurnal Kefarmasian Indonesia*, 10(2), 87-94. doi:10.22435/jki.v10i2.2488
- Yulinery, T., & Nurhidayat, N. (2012). Analisis Viabilitas Probiotik *Lactobacillus Terenkapsulasi* dalam Penyalut Dekstrin dan Jus Markisa (*Passiflora edulis*). *Jurnal Teknologi Lingkungan*, 13(1), 109-121. doi:<https://doi.org/10.29122/jtl.v13i1.1411>