

## DAFTAR PUSTAKA

- Akmeemana, C., Somendrika, D., Wickramasinghe, I., & Wijesekara, I. (2025). A taguchi approach to optimizing cassava bagasse packaging: exploring the effects of peel fraction, plasticizer combinations, and material concentration. *Food and Humanity*, 4. <https://doi.org/10.1016/j.foohum.2025.100612>
- Amaregouda, Y., & Kamanna, K. (2024). Carboxymethyl cellulose/starch-based films incorporating chitosan nanoparticles for multifunctional food packaging. *Cellulose*, 31(4), 2413–2427. <https://doi.org/10.1007/s10570-024-05753-8>
- AOAC Official Method 999.01. (2002). *Volatile bases in fish, ammonia ion selective electrode method*. II.
- Arias, L. V. A., Silva, V. de S., Vieira, J. M. M., Fakhouri, F. M., & de Oliveira, R. A. (2024). Plant-based films for food packaging as a plastic waste management alternative: potato and cassava starch case. *Polymers*, 16(17), 1–15. <https://doi.org/10.3390/polym16172390>
- ASTM International. (2017). *ASTM E1508-12a Standard Guide for Quantitative Analysis by Energy-Dispersive Spectroscopy*. <https://doi.org/10.1520/E1508-12A.2>
- Atasasih, H., Paramita, I. S., & Fitriani, F. (2023). Uji daya terima aneka frozen food berbahan dasar tempe sebagai alternative PMT balita. *Jurnal Kesehatan Komunitas*, 9(1), 40–46. <https://doi.org/10.25311/keskom.vol9.iss1.1257>
- Augusto, A., Marques, S., Félix, R., Dias, J., Alves, N., Shiels, K., Murray, P., Novais, S. C., Lemos, M. F. L., & Silva, S. F. J. (2024). A novel seaweed-based biodegradable and active food film to reduce freezer burn in frozen salmon. *Food Hydrocolloids*, 156. <https://doi.org/10.1016/j.foodhyd.2024.110332>
- Ayyubi, S. N., Purbasari, A., & Kusmiyati. (2022). The effect of composition on mechanical properties of biodegradable plastic based on chitosan/cassava starch/PVA/crude glycerol: optimization of the composition using box behnken design. *Materials Today: Proceedings*, 63, S78–S83. <https://doi.org/10.1016/j.matpr.2022.01.294>
- Badan Pengawas Obat dan Makanan. (2021a). *Pedoman Cara Pengolahan dan Penanganan Pangan Olahan Beku yang Baik*. Badan Pengawas Obat dan Makanan RI.
- Badan Pengawas Obat dan Makanan. (2021b). *Penjelasan Badan POM RI Tentang Ketentuan Perizinan Pangan Olahan yang Disimpan Beku*. <https://www.pom.go.id/penjelasan-publik/penjelasan-badan-pom-ri-tentang-ketentuan-perizinan-pangan-olahan-yang-disimpan-beku>
- Badan Pusat Statistik. (2026). *Rata-rata Konsumsi Perkapita Seminggu Menurut Kelompok Daging Per Kabupaten/Kota (Satuan Komoditas)*. <https://www.bps.go.id/indicator/5/2097/1/rata-rata-konsumsi-perkapita-seminggu-menurut-kelompok-daging-per-kabupaten-kota.html>
- Badan Standardisasi Nasional. (1992). *SNI 01-2891-1992 Cara Uji Makanan Minuman*.
- Badan Standardisasi Nasional. (2014). *SNI 7818: 2014 Kantong Plastik Mudah Terurai*.

- Badan Standardisasi Nasional. (2022). *SNI 9126:2022 Ubi kayu*.
- Bernardez-Morales, G. M., Douglas, S. L., Nichols, B. W., Barraza-cordero, R. J., Belk, A. D., Brandebourg, T. D., Reyes, T. M., & Sawyer, J. T. (2024). Vacuum packaging can protect ground beef color and oxidation during cold storage. *Foods*, *13*(2841), 1–15. <https://doi.org/10.3390/foods13172841>
- Çelik, İ., & Alagöz, E. (2025). Quality changes in chicken meat marinated with rich fruit and vegetable juices. *Food Science & Nutrition*, 1–9. <https://doi.org/10.1002/fsn3.70135>
- Chamorro, A. F., Palencia, M., & Lerma, T. A. (2025). Physicochemical characterization and properties of cassava starch: a review. *Polymers*, *17*(12), 1–31. <https://doi.org/10.3390/polym17121663>
- Chen, X., Shi, X., Cai, X., Yang, F., Li, L., Wu, J., & Wang, S. (2021). Ice-binding proteins: a remarkable ice crystal regulator for frozen foods. *Critical Reviews in Food Science and Nutrition*, *61*(20), 3436–3449. <https://doi.org/10.1080/10408398.2020.1798354>
- Cortés-Rodríguez, M., Villegas-Yépez, C., Gil González, J. H., Rodríguez, P. E., & Ortega-Toro, R. (2020). Development and evaluation of edible films based on cassava starch, whey protein, and bees wax. *Heliyon*, *6*(9), 1–7. <https://doi.org/10.1016/j.heliyon.2020.e04884>
- da Costa Nunes, E., Uarrota, V. G., Moresco, R., & Maraschin, M. (2021). Physico-chemical profiling of edible or sweet cassava (*Manihot esculenta* Crantz) starches from Brazilian germplasm. *Food Bioscience*, *43*. <https://doi.org/10.1016/j.fbio.2021.101305>
- Dang, D. S., Bastarrachea, L. J., Martini, S., & Matarneh, S. K. (2021). Crystallization behavior and quality of frozen meat. *Foods*, *10*(11), 1–20. <https://doi.org/10.3390/foods10112707>
- Elean, S., Saleh, C., & Hindryawati, N. (2018). Pembuatan film biodegradable dari pati biji cempedak dan carboxy methyl cellulose dengan penambahan gliserol. *Jurnal Atomik*, *03*(2), 122–126.
- Elsherief, M. F., Devecioglu, D., Saleh, M. N., & Karbancioglu-guler, F. (2024). Chitosan/alginatepectin biopolymer-based nanoemulsions for improving the shelf life of refrigerated chicken breast. *International Journal of Biological Macromolecules*, *264*(P2), 130213. <https://doi.org/10.1016/j.ijbiomac.2024.130213>
- Ernita, L., & Riza, M. (2020). The performance and characterization of biodegradable plastic from tapioca starch: effect of modified chitosan. *Journal of Chemical Engineering and Environment*, *15*(1), 45–52. <https://doi.org/10.23955/rkl.v15i1.15441>
- European Bioplastics Nova Institute. (2024). *Global Production Capacities of Bioplastics*. <https://www.european-bioplastics.org/market/>
- Feiner, G. (2006). *Meat Products Handbook*. Woodhead Publishing.
- GCCF. (2024). Poultry and Poultry Products. In *Commodity Storage & Handling Manual (Rev. ed.)*. <https://doi.org/10.1201/9780203755495-3>
- Giovani, S., Oktafiani, Z. I., Komalasari, E., & Setiyoko, A. (2024). Effect of packaging type and storage time on the quality characteristics of chicken nugget substituted with jack bean (*Canavalia ensiformis* L.) tempeh flour.

- Journal of Applied Food Technology*, 11(1), 32–42.  
<https://doi.org/10.17728/jaft.22983>
- Gupta, P., Toksha, B., & Rahaman, M. (2022). A review on biodegradable packaging films from vegetative and food waste. *Chemical Record*, 22(7), 1–37. <https://doi.org/10.1002/tcr.202100326>
- Haghighi, H., Licciardello, F., Fava, P., Siesler, H. W., & Pulvirenti, A. (2020). Recent advances on chitosan-based films for sustainable food packaging applications. *Food Packaging and Shelf Life*, 26, 1–16. <https://doi.org/10.1016/j.fpsl.2020.100551>
- Hernández, M. S., Ludueña, L., & Flores, S. (2024). Mixture Design for the Development of Biodegradable Active Strands Based on Acetylated Cassava Starch, Chitosan and Oregano Essential Oil. In *Springer Proceedings in Materials* (Vol. 50). [https://doi.org/10.1007/978-3-031-64106-0\\_28](https://doi.org/10.1007/978-3-031-64106-0_28)
- Hernández, M. S., Ludueña, L. N., & Flores, S. K. (2023). Citric acid, chitosan and oregano essential oil impact on physical and antimicrobial properties of cassava starch films. *Carbohydrate Polymer Technologies and Applications*, 5. <https://doi.org/10.1016/j.carpta.2023.100307>
- Hisam, M. W., Dar, A. A., Elrasheed, M. O., Khan, M. S., Gera, R., & Azad, I. (2024). The versatility of the taguchi method: optimizing experiments across diverse disciplines. *Journal of Statistical Theory and Applications*, 23, 365–389. <https://doi.org/10.1007/s44199-024-00093-9>
- Janaum, N., Butsiri, T., Kasemsiri, P., Souvanh, M., Pongsa, U., Theerakulpisut, S., Hiziroglu, S., & Okhawilai, M. (2020). Multi response optimization of bioactive starch foam composite using taguchi's method and grey relational analysis. *Journal of Polymers and the Environment*, 28(5), 1513–1525. <https://doi.org/10.1007/s10924-020-01706-x>
- Kaewthong, P., Pomponio, L., R., C. J., Knochel, S., Wattanachant, S., & Karlsson, A. H. (2019). Changes in the quality of chicken breast meat due to superchilling and temperature fluctuations during storage. *The Journal of Poultry Science*, 59(4), 308–317. <https://doi.org/10.2141/jpsa.0180106>
- Kementerian Lingkungan Hidup dan Kehutanan. (2024). *Komposisi Sampah Berdasarkan Jenis Sampah di D.I. Yogyakarta Tahun 2024*. <https://sipsn.kemenlh.go.id/sipsn/public/data/komposisi>
- Kong, D., Quan, C., Xi, Q., Han, R., Koseki, S., Li, P., Du, Q., Yang, Y., Forghani, F., & Wang, J. (2022). Study on the quality and myofibrillar protein structure of chicken breasts during thawing of ultrasound-assisted slightly acidic electrolyzed water (SAEW). *Ultrasonics Sonochemistry*, 88, 106105. <https://doi.org/10.1016/j.ultsonch.2022.106105>
- Krishnaiah, K., & Shahabudeen, P. (2007). *Applied design of experiments and taguchi methods*. PHI Learning Private Limited.
- Kumar, V., Karan, D., Sahu, G., Kumar, N., & Kumar, S. (2025). Sustainable modifications in food packaging : a comprehensive review of biodegradable material revolutions. *Applied Food Research*, 5(2), 101385. <https://doi.org/10.1016/j.afres.2025.101385>
- Kusumawati, R., Syamdidi, Abdullah, A. H. D., Nissa, R. C., Firdiana, B., Handayani, R., Munifah, I., Dewi, F. R., Basmal, J., & Wibowo, S. (2025).

- Physical properties of biodegradable chitosan-cassava starch based bioplastic film mechanics. *Science and Technology Indonesia*, 10(1), 191–200. <https://doi.org/10.26554/sti.2025.10.1.191-200>
- Lin, L., Peng, S., Shi, C., Li, C., Hua, Z., & Cui, H. (2022). Preparation and characterization of cassava starch/sodium carboxymethyl cellulose edible film incorporating apple polyphenols. *International Journal of Biological Macromolecules*, 212, 155–164. <https://doi.org/10.1016/j.ijbiomac.2022.05.121>
- Marcinkowska-Lesiak, M., Zdanowska-sąsiadek, Ż., Damaziak, K., Michalczyk, M., Poławska, E., Wyrwisz, J., Wierzbička, A., & Zdanowska-sąsiadek, Ż. (2016). Effect of packaging method and cold-storage time on chicken meat quality. *CyTA - Journal of Food*, 14(1), 41–46. <https://doi.org/10.1080/19476337.2015.1042054>
- Mardhika, H., Dwiloka, B., & Setiani, B. E. (2020). Pengaruh berbagai metode thawing daging ayam petelur afkir beku terhadap kadar protein, protein terlarut dan kadar lemak steak ayam. *Jurnal Teknologi Pangan*, 4(1), 48–54. <https://doi.org/10.14710/jtp.2020.26546>
- Matheus, J. R. V., de Farias, P. M., Satoriva, J. M., de Andrade, C. J., & Fai, A. E. C. (2023). Cassava starch films for food packaging: Trends over the last decade and future research. *International Journal of Biological Macromolecules*, 225, 658–672. <https://doi.org/10.1016/j.ijbiomac.2022.11.129>
- Natalia, E. V., & Muryeti. (2020). Pembuatan plastik biodegradable dari pati singkong dan kitosan. *Journal Printing and Packaging Technology*, 1(1), 57–68. <https://doi.org/10.32722/printpack.v1i1.1679>
- Nursubiyantoro, E., & Yulianto, W. W. E. (2019). *Teknologi Peniris Minyak Sentra Industri Ayam Goreng Kalasan*. [http://eprints.upnyk.ac.id/34494/%0Ahttp://eprints.upnyk.ac.id/34494/1/Buku Teknologi Peniris Minyak.pdf](http://eprints.upnyk.ac.id/34494/%0Ahttp://eprints.upnyk.ac.id/34494/1/Buku%20Teknologi%20Peniris%20Minyak.pdf)
- Öksüz, A., Alkan, Ş. B., & Örs, E. D. (2023). The effect of improper packaging on moisture and fatty acid composition in frozen bluefin tuna (*Thynnus Thynnus*). *Aquatic Sciences and Engineering*, 38(1), 68–73. <https://doi.org/10.26650/ASE20221206807>
- Osaili, T. M., Al-Nabulsi, A. A., Hasan, F., Dhanasekaran, D. K., Cheikh Ismail, L., Naja, F., Radwan, H., Olaimat, A. N., Ayyash, M., Ali, A., Obaid, R. S., & Holley, R. (2024). Role of marination, natural antimicrobial compounds, and packaging on microbiota during storage of chicken tawook. *Poultry Science*, 103(6), 1–11. <https://doi.org/10.1016/j.psj.2024.103687>
- Othman, S. H., Shapi'i, R. A., & Ronzi, N. D. A. (2024). Starch biopolymer films containing chitosan nanoparticles: A review. *Carbohydrate Polymers*, 329, 1–21. <https://doi.org/10.1016/j.carbpol.2023.121735>
- Ounkaew, A., Kasemsiri, P., Pongsa, U., Hiziroglu, S., Pasuwan, P., Boonlai, Y., & Theerakulpisut, S. (2022). Multiple response optimization of poly(vinyl alcohol)/starch based bioactive composite films for antimicrobial packaging applications. *Journal of Polymers and the Environment*, 30(5), 1787–1802. <https://doi.org/10.1007/s10924-021-02308-x>

- Oyekunle, D. T., Nia, M. H., & Wilson, L. D. (2024). Recent progress on the application of chitosan, starch and chitosan–starch composites for meat preservation—a mini review. *Journal of Composites Science*, 8(8), 1–30. <https://doi.org/10.3390/jcs8080302>
- Pemerintah Daerah Istimewa Yogyakarta. (2025). *Ayam Goreng Kalasan, Kuliner Legendaris Dengan Kremes Guruhnya*. <https://jogjaprovo.go.id/berita/detail-berita/ayam-goreng-kalasan-kuliner-legendaris-dengan-kremes-guruhnya>
- Pires, J. R. A., de Souza, V. G. L., & Fernando, A. L. (2018). Chitosan/montmorillonite bionanocomposites incorporated with rosemary and ginger essential oil as packaging for fresh poultry meat. *Food Packaging and Shelf Life*, 17, 142–149. <https://doi.org/10.1016/j.fpsl.2018.06.011>
- Pranoto, Y., Ariyani, B., Supartono, W., & Pamungkas, A. P. (2022). Utilization of sugar palm (*Arenga prinnata*) dreg in biodegradable plastic processing. *Journal of Indonesian Food and Nutrition Progress*, 19(2), 73–80. <https://doi.org/10.22146/ifnp.63026>
- Rahmadi Putri, T., Adhitasari, A., Paramita, V., Endy Yulianto, M., & Dwi Ariyanto, H. (2023). Effect of different starch on the characteristics of edible film as functional packaging in fresh meat or meat products: A review. *Materials Today: Proceedings*, 87, 192–199. <https://doi.org/10.1016/j.matpr.2023.02.396>
- Rashwan, A. K., Younis, H. A., Abdelshafy, A. M., Osman, A. I., Eletmany, M. R., Hafouda, M. A., & Chen, W. (2024). Plant starch extraction, modification, and green applications: a review. *Environmental Chemistry Letters*, 22(5), 2483–2530. <https://doi.org/10.1007/s10311-024-01753-z>
- Rasyid, F. S., & Grehenson, G. (2026). *Kenaikan Harga Plastik Menggerus Pendapatan UMKM, Ekonom UGM Desak Keberpihakan Pemerintah*. <https://ugm.ac.id/id/berita/kenaikan-harga-plastik-menggerus-pendapatan-umkm-ekonom-ugm-desak-keberpihakan-pemerintah/>
- Rinwi, T. G., Sun, D. W., Ma, J., & Wang, Q. J. (2024). Enhancing frozen chicken meat quality by isochoric storage as compared with conventional frozen storage. *Lwt*, 208, 1–9. <https://doi.org/10.1016/j.lwt.2024.116608>
- Risma, & Pratiknya, D. E. (2024). *The differences in meat storage using a vacuum, freezer, and a combination of vacuum and freezer against spoilage bacteria*. 7, 326–335. <https://doi.org/10.26655/JMCHEMSCI.2024.2.5>
- Roy, R. K. (2010). A Primer on The Taguchi Method. In *SpringerReference. Society of Manufacturing Engineers*. [https://doi.org/10.1007/springerreference\\_7290](https://doi.org/10.1007/springerreference_7290)
- Rusliman, D., Wicaksono, R., & Wibowo, C. (2025). Formulasi dan karakterisasi biodegradable film berbahan kitosan dan sodium alginate dengan kombinasi pati ganyong dan konjak glukomanan [Formulation and characterization of biodegradable films made from chitosan and sodium alginate combined with ganyong]. *Agrointek: Jurnal Teknologi Industri Pertanian*, 19(2), 297–309. <https://doi.org/10.21107/agrointek.v19i2.24744>
- Sari, W. M., Supartono, W., & Suharno. (2024). Characterization of biodegradable films from raw seaweed (*Kappaphycus alvarezii*) and glycerol. *IOP Conference Series: Earth and Environmental Science*, 1364(1), 1–11.

- <https://doi.org/10.1088/1755-1315/1364/1/012081>
- Shi, C., Jia, L., Tao, H., Hu, W., Li, C., Aziz, T., Al-Asmari, F., Sameeh, M. Y., Cui, H., & Lin, L. (2024). Fortification of cassava starch edible films with *Litsea cubeba* essential oil for chicken meat preservation. *International Journal of Biological Macromolecules*, 276, 1–13. <https://doi.org/10.1016/j.ijbiomac.2024.133920>
- Singh, R. P., Heldman, D. R., & Erdoğdu, F. (2019). *Introduction to Food Engineering Fourth Edition*. <https://doi.org/10.1016/b978-0-12-823129-6.00005-2>
- Siswanti, Anandito, R. B. K., & Affandi, D. R. (2018). IbM industri rumah tangga ayam ungkep. *Journal of Community Empowering a Services*, 2(1), 15–20. <https://doi.org/10.20961/prima.v2i1.36113>
- Sondari, D., Ningrum, R. S., Triwulandari, E., Nurhayat, O. D., Putri, R., Pramasari, D. A., & Restu, W. K. (2021). Characterization of biodegradable edible film based on cassava loaded with chitosan. *AIP Conference Proceedings*, 2331. <https://doi.org/10.1063/5.0041701>
- Sukartiko, A. C., Supartono, W., Neisyafitri, R. J., & Setiyono, R. (2024). *Standardization efforts for ayam goreng kalasan industry cluster through a partnership between the university and local government to maintain its local wisdom*. 10(3), 157–163. <https://doi.org/10.22146/jpkm.90990>
- Sun, D. W. (2005). Handbook of frozen food processing and packaging. In *Handbook of Frozen Food Processing and Packaging*.
- Sun, L., Zhu, Z., & Sun, D. W. (2023). Regulating ice formation for enhancing frozen food quality: Materials, mechanisms and challenges. *Trends in Food Science and Technology*, 139, 1–14. <https://doi.org/10.1016/j.tifs.2023.07.013>
- Tan, X., Sun, A., Cui, F., Li, Q., Wang, D., Li, X., & Li, J. (2024). The physicochemical properties of cassava starch/carboxymethyl cellulose sodium edible film incorporated of *Bacillus* and its application in salmon fillet packaging. *Food Chemistry: X*, 23, 1–14. <https://doi.org/10.1016/j.fochx.2024.101537>
- Toutenburg, H., & Salabh. (2009). *Statistical Analysis of Designed Experiments, Third Edition*. Springer Science+Business Media.
- Triyannanto, E., Rahmatulloh, S., Astuti, D., Putra, T. I. D., Diqna, H. I., & Fauziah, S. (2021). Pengaruh perbedaan kemasan primer pada kualitas fisik-kimia, mikrobiologi serta sensoris daging ayam frozen utuh pada suhu-18°C. *Jurnal Sain Peternakan Indonesia*, 16(2), 123–129. <https://doi.org/10.31186/jspi.id.16.2.123-129>
- Valencia-Sullca, C., Atarés, L., Vargas, M., & Chiralt, A. (2018). Physical and antimicrobial properties of compression-molded cassava starch-chitosan films for meat preservation. *Food and Bioprocess Technology*, 11(7), 1339–1349. <https://doi.org/10.1007/s11947-018-2094-5>
- Wang, F., Liang, R., Zhang, Y., Gao, S., Zhu, L., Niu, L., Luo, X., Mao, Y., & Hopkins, D. L. (2021). Effects of packaging methods combined with frozen temperature on the color of frozen beef rolls. *Meat Science*, 171(May 2020), 108292. <https://doi.org/10.1016/j.meatsci.2020.108292>

- Wang, Y., Xia, Y., Zhang, P., Ye, L., Wu, L., & He, S. (2017). Physical characterization and pork packaging application of chitosan films incorporated with combined essential oils of cinnamon and ginger. *Food and Bioprocess Technology*, 10(3), 503–511. <https://doi.org/10.1007/s11947-016-1833-8>
- Warkoyo, W., Haris, M. A., & Wahyudi, V. A. (2022). The physical, mechanical, barrier characteristics, and application of edible film from yellow sweet potato and aloe vera gel. *Agritech*, 42(4), 390–399. <https://doi.org/10.22146/agritech.68633>
- Windyasmara, L., Purwati, C. S., & Pratama, D. Y. (2024). Kualitas daging ayam petelur afkir pada pasar tradisional di kabupaten wonogiri. *Agrinimal Jurnal Ilmu Ternak Dan Tanaman*, 12(2), 88–94. <https://doi.org/10.30598/ajitt.2024.12.2.88-94>
- Yoezer, N., Gurung, D. B., & Wangchuk, K. (2023). Environmental toxicity, human hazards and bacterial degradation of polyethylene. *Nature Environment and Pollution Technology*, 22(3), 1155–1167. <https://doi.org/10.46488/NEPT.2023.v22i03.006>
- Zhan, X., Sun, D. W., Zhu, Z., & Wang, Q. J. (2018). Improving the quality and safety of frozen muscle foods by emerging freezing technologies: A review. *Critical Reviews in Food Science and Nutrition*, 58(17), 2925–2938. <https://doi.org/10.1080/10408398.2017.1345854>
- Zhang, M., Zhang, F., Li, C., An, H., Wan, T., & Zhang, P. (2022). Application of chitosan and its derivative polymers in clinical medicine and agriculture. *Polymers*, 14(5). <https://doi.org/10.3390/polym14050958>