DAFTAR PUSTAKA

Abubakar Abdullahi R, M. H. (2020). Preparation of Medicinal Plants: Basic Extraction and Fractionation Procedures for Experimental Purposes. *Journal of Pharmacy and Bioallied Sciences*, *12*(1), 1–10. https://doi.org/10.4103/jpbs.JPBS

Adamczak, A., Ożarowski, M., & Karpiński, T. M. (2020). Antibacterial activity of some flavonoids and organic acids widely distributed in plants. *Journal of Clinical Medicine*, *9*(1). https://doi.org/10.3390/jcm9010109

Adriani, A. (2022). Penanganan, pengolahan, dan pengawasan pangan (Tanaman, Ikan dan Ternak). *Prosiding Seminar Nasional Lahan Suboptimal Ke-10*, *6051*, 18–26.

Aisiah Nurul, D. M. (2021). *Konsep Dasar Proses Pengeringan Pangan* (Pertama; Nurenik, ed.). Malang. AE Publishing.

Ajizah, A. (2004). Sensitivitas Salmonella Typhimurium Terhadap Ekstrak Daun Psidium Guajava L . *Sensitivitas Salmonella Typhimuriumterhadap Ekstrak Daun Psidiumguajava L*, *1*, 31–38.

Akbulut, H. F., & Akbulut, M. (2023). Mineral composition, the profile of phenolic compounds, organic acids, sugar and in vitro antioxidant capacity, and antimicrobial activity of organic extracts of Juniperus drupacea fruits. *Food Science and Nutrition*, *11*(10), 6435–6446. https://doi.org/10.1002/fsn3.3586

Al-khayri, J. M., Rashmi, R., Toppo, V., Chole, P. B., Banadka, A., Sudheer, W. N., ... Rezk, A. A. (2023). Plant secondary metabolites : the weapons for biotic stress management. *Journal Metabolites*, *13. No. 71*, 1–37.

Alakolanga, A. G. A. W., Kumar, N. S., Jayasinghe, L., & Fujimoto, Y. (2015). *Antioxidant property and α -glucosidase , α -amylase and lipase inhibiting activities of Flacourtia inermis fruits : characterization of malic acid as an inhibitor of the enzymes*. *52*(December), 8383–8388. https://doi.org/10.1007/s13197-015-1937-6

Alamsyah, F. H., Irfan, I., & Yunita, D. (2021). Penggunaan asap cair sebagai pengawet alami bakso ikan tuna sirip kuning (Thunnus albacares). *Teknologi Pangan : Media Informasi Dan Komunikasi Ilmiah Teknologi Pertanian*, *12*(1), 103–109. https://doi.org/10.35891/tp.v12i1.2211

Alfauzi, R. A., Hartati, L., Suhendra, D., Rahayu, T. P., & Hidayah, N. (2022). *Ekstraksi Senyawa Bioaktif Kulit Jengkol (Archidendron jiringa) dengan Konsentrasi Pelarut Metanol Berbeda sebagai Pakan Tambahan Ternak Ruminansia*. *20*(3), 95–103.

Alkarri, S., Bin Saad, H., & Soliman, M. (2024). On antimicrobial polymers: development, mechanism of action, international testing procedures, and applications. *Journal Polymers*, *16*(6), 1–43. https://doi.org/10.3390/polym16060771

Altemimi, A., Lakhssassi, N., Baharlouei, A., Watson, D. G., & Lightfoot, D. A. (2017). Phytochemicals: Extraction, isolation, and identification of bioactive compounds from plant extracts. *Plants*, *6*(4). https://doi.org/10.3390/plants6040042

Amrie; Al; Ivan, S. A. R. (2014). Efefectivity test of Harrisonia perforata Merr and root extracts as inhibitor of Vibrio cholerae growth. *Jurnal Of Natural Science*, *Vol 3. No.*(December), 331–340.

Anggraeni Dan Nurlela. (2019). Efektivitas antibakteri bawang putih (Allium sativum L) sebagai pengawet alami pada ikan Lele Dumbo (Clarias gariephinus) segar. *Jurnal Ilmiah Ilmu Keperawatan Dan Ilmu Kesehatan "Surya Medika," Vol. 14. N*, 26–31.

Anggraeni, W., Lukman, H., & Pramusintho, B. (2022). Pengaruh lama simpan dan metoda pengemasan terhadap sifat fisik bakso daging ayam pada penyimpanan di suhu rendah (± 5o C). *Jurnal Ilmiah Ilmu-Ilmu Peternakan*, *25*(1), 91–99. https://doi.org/10.22437/jiiip.v25i1.12471

Anindyajati, M., Dwiloka, B., & Al-Baarri, A. (2022). Kekenyalan, kadar lemak, kadar protein dan mutu hedonik bakso daging kalkun (Meleagris gallopavo) berdasarkan potongan komersial karkas. *Jurnal Teknologi Pangan*, *6*(2), 32–37. https://doi.org/10.14710/jtp.2022.30119

AOAC. (2005). *AOAC*. 1–28. Retrieved from https://www.academia.edu/43245633/Of_fi_cial_Methods_of_Anal_y_sis_of_AOAC_IN_TER_NA_TIONAL_18th_Edi_tion_2005

Ardianti Y, Widyastuti, Rosmialawati, Saptono, H. D. (2017). Pengaruh penambahan karegenan terhadap sifat fisik dan organoleptik bakso ikan Tongkol (Euthynnus affinis). *Jurnal Agroteknos*, *24*(3), 159–166.

Ardianti Yulu, Widyastuti, Rosmilawati, H. D. (2014). Effect carrageenan on the physical and organoleptic properties of fish ball (Euthynnus affinis). *Journal Agroteksos*, *24*(3), 159–166.

Auliata, S., Sribudiani, E., & Somadona, S. (2021). Karakteristik perekat dan perekatan tanin resorsinol formaldehida pada sirekat Akasia (Acacia mangium) dan Pulai (Alstonia scholaris). *Perennial*, *17*(2), 35–44. Retrieved from http://dx.doi.org/10.24259/perennial.v17i2.12759

Baby, T. B., Murali, R., Suriyaprakash, T. N. K., Venkatachalam, V. V., Anbiah, S. V., Srinivasan, N., & Ajeesh, V. (2023). Phytochemical profiling and pancreatic

lipase inhibitory activity of Flacourtia inermis Roxb. fruits. *Journal of Natural Remedies*, *23*(2), 513–520. https://doi.org/10.18311/jnr/2023/32051

Bachmanov, A. A., Bosak, N. P., Glendinning, J. I., Inoue, M., Li, X., Manita, S., ... Beauchamp, G. K. (2016). Genetics of amino acid taste and appetite. *Journal Suplement*, *7*(4), 806S-822S. https://doi.org/10.3945/an.115.011270

Badan Standar Nasional. (2017). SNI Bakso Ikan. *Standar Nasional Indonesia*, 3–12.

Badaruddin. (2019). Pengolahan bakso ikan tenggiri (Scomberomorus comersonni) dengan konsetrasi tepung tapioka berdasarkan uji organolepti. *Jurnal Riser Perikanan*, *1*(2), 83–93.

Banjara, R. A., Jadhav, S. K., & Bhoite, S. A. (2012). Antibacterial activity of di-2-ethylaniline phosphate screened by paper disc diffusion method. *Journal of Applied Pharmaceutical Science*, *2*(7), 230–233. https://doi.org/10.7324/JAPS.2012.2720

Baran, A., Kwiatkowska, A., & Potocki, L. (2023). Antibiotics and bacterial resistance—A short story of an endless arms race. *International Journal of Molecular Sciences*, *24*(6). https://doi.org/10.3390/ijms24065777

Barbehenn, R. V., & Peter Constabel, C. (2011). Tannins in plant-herbivore interactions. *Phytochemistry*, *72*(13), 1551–1565. https://doi.org/10.1016/j.phytochem.2011.01.040

Biswas, A., Dey, S., Xiao, A., Huang, S., Birhanie, Z. M., Deng, Y., ... Li, D. (2023). Phytochemical content and antioxidant activity of different anatomical parts of Corchorus olitorius and C. capsularis during different phenological stages. *Heliyon*, *9*(6). https://doi.org/10.1016/j.heliyon.2023.e16494

Bleicher, J., Ebner, E. E., & Bak, K. H. (2022). Formation and analysis of volatile and odor compounds in meat—A Review. *Molecules*, *27*(19), 1–31. https://doi.org/10.3390/molecules27196703

Bouriga N, Bejaoui S, Jemmali B, Quinard J P, T. M. (2020). Effects smoking processes on the nutritional value and fatty acid coposition of Zander Fixh (Sander lucioperca). *Journal Grasas Aceites*, *71*(1), 2–8.

BPOM. (2021). Badan pengawas obat dan makanan republik indonesia. *BPOM*, *11*, 1–16.

Breijyeh, Z., Jubeh, B., & Karaman, R. (2020). Resistance of gram-negative bacteria to current antibacterial agents and approaches to resolve it. *Molecules*, *25*(6), 1340.

BSN. (2015). Cara uji mikrobiologi - Bagian 3: Penentuan Angka Lempeng Total

(ALT) pada produk perikanan. *Badan Standardisasi Nasional: Jakarta*, 11.

Cahyaningsih, E., & Yuda, P. E. S. K. (2020). Uji Aktivitas ekstrak daun Mimba (Azadirachta indica A. Juss) sebagai bahan pengawet alami buah tomat. *Jurnal Ilmiah Medicamento*, *6*(2), 118–122. https://doi.org/10.36733/medicamento.v6i2.1108

Cahyono E, R. (2017). Analisis asam amino beberapa jenis teripang olahan kering di Kabupaten Sangihe. *Jurnal Ilmiah Tindalung*, *3*(1), 36–42.

Cardoso-Gutierrez, E., Aranda-Aguirre, E., Robles-Jimenez, L. E., Castelán-Ortega, O. A., Chay-Canul, A. J., Foggi, G., ... González-Ronquillo, M. (2021). Effect of tannins from tropical plants on methane production from ruminants: A systematic review. *Veterinary and Animal Science*, *14*. https://doi.org/10.1016/j.vas.2021.100214

Cato L, Rosyidi Dj, T. I. (2019). Pengaruh subtitusi tepung Porang (Amorphophallus oncophyllus. *Jurnal Ternak Tropika*, *16*(1), 15–23.

Chintya, N., & Utami, B. (2017). Ekstraksi tannin dari daun Sirsak (Annona muricata L.) sebagai pewarna alami tekstil. *JC-T (Journal Cis-Trans): Jurnal Kimia Dan Terapannya*, *1*(1), 22–29. https://doi.org/10.17977/um026v1i12017p022

Cushnie, T. P. T., & Lamb, A. J. (2005). Antimicrobial activity of flavonoids. *International Journal of Antimicrobial Agents*, *26*(5), 343–356. https://doi.org/10.1016/j.ijantimicag.2005.09.002

Cushnie, T. P. T., O'Driscoll, N. H., & Lamb, A. J. (2016). Morphological and ultrastructural changes in bacterial cells as an indicator of antibacterial mechanism of action. *Cellular and Molecular Life Sciences*, *73*(23), 4471–4492. https://doi.org/10.1007/s00018-016-2302-2

Dangi, N., & Yadav, B. S. (2020). Characterization of partial acid hydrolysates of citrus pectin for their pasting, rheological and thermal properties. *Journal of Food Science and Technology*, *57*(7), 2681–2692. https://doi.org/10.1007/s13197-020-04304-w

Darah, I., Lim, S. H., & Nithianantham, K. (2013). Effects of methanol extract of Wedelia chinensis osbeck (asteraceae) leaves against pathogenic bacteria with emphasise on Bacillus cereus. *Indian Journal of Pharmaceutical Sciences*, *75*(5), 533–539.

Das, A. K., Islam, M. N., Faruk, M. O., Ashaduzzaman, M., & Dungani, R. (2020). Review on tannins: Extraction processes, applications and possibilities. *South African Journal of Botany*, *135*, 58–70. https://doi.org/10.1016/j.sajb.2020.08.008

Datu, O. S., Sari, J., & Utami Sasmita. (2023). *UJI AKTIVITAS ANTIOKSIDAN,*

ANALISIS TOTAL FENOL, FLAVONID DAN TANIN DARI EKSTRAK BUAH SALAK. *6*(2), 117–122.

Davis, W. W., & Stout, T. R. (1971). Disc plate method of microbiological antibiotic assay. *Applied Microbiology*, *22*(4), 659–665. https://doi.org/10.1128/aem.22.4.659-665.1971

Department, F. and E. H. (2014). Microbiological guidelines for food. *Centre for Food Safety*, *2014*(August), 1–38. Retrieved from https://www.cfs.gov.hk/english/food_leg/files/food_leg_Microbiological_Guidelines_for_Food_e.pdf

Derwin, C., Christiana, J., Palenewen, V., & Onibala, H. (2022). Microbiological and organoleptic quality of yellow fin tuna (Thunnus albacores) fillet during cold storage). *Perikanan Dan Kelautan Tropis*, *12*(1), 14–23.

Dewi, Astuti, W. (2013). *IDENTIFIKASI KANDUNGAN KIMIA EKSTRAK KULIT BUAH MANGGIS (Garcinia mangostana L.)* (pp. 13–18). pp. 13–18.

Dillak, Kristiani, S. K. (2019). Metabolites and antioxidant activity of ethanolic Faloak (Sterculia quarifida). *Jurnal Biosaintifika*, *11*(3), 296–303. Retrieved from https://journal.unnes.ac.id/nju/index.php/biosaintifika/article/view/20736

Doyle M P. (2019). Compendium og the microbiologycal spoilage of foods and beverages. *Food Microbiology And Food Safety*, *8*(2), 1–18. https://doi.org/10.1016/s1571-5078(05)04015-8

Efenberger-Szmechtyk, M., Nowak, A., & Czyzowska, A. (2021). Plant extracts rich in polyphenols: antibacterial agents and natural preservatives for meat and meat products. *Critical Reviews in Food Science and Nutrition*, *61*(1), 149–178. https://doi.org/10.1080/10408398.2020.1722060

Elisha, I. L., Botha, F. S., McGaw, L. J., & Eloff, J. N. (2017). The antibacterial activity of extracts of nine plant species with good activity against Escherichia coli against five other bacteria and cytotoxicity of extracts. *BMC Complementary and Alternative Medicine*, *17*(1), 133. https://doi.org/10.1186/s12906-017-1645-z

Elnawati., A. P. N. (2018). Pemanfataan ekstrak air buah Flacourtia inermis Roxb sebagai pengawet ikan laut. *ALOTROP, Jurnal Pendidikaan Dan Ilmu Kimia*, *2*(1), 1–7.

Erna, C., Megawati, F., & Artini, N. P. E. (2021). Effectiveness test of pare leaf extract (Momordica charantia L.) as a natural preservative of tomatoes. *Jurnal Ilmiah Medicamneto7*, *7*(1), 41–46.

Fadeyi, A. E., Adeniran, O. I., & Akiode, S. O. (2022). Nutriens, phytochemical, antioxidant and antimicrobial analysis of Pterocarpus osun stem bark and leaf

for their nutrional, medical capacity. *Indonesian Journal of Chemical Research*, *10*(1), 58–67. https://doi.org/10.30598//ijcr.2022.10-ade

Fahmi, A., Syukur, S., Chaidir, Z., & Melia, S. (2024). Phytochemical, antimicrobial, antioxidant, and catechin analysis of green tea (Camelia sinensis vae assamica) from North Sumatera. Indonesia. *Journal Chemical :Rasayan"*, *17*(2), 417–424.

Falcão, L., & Araújo, M. E. M. (2018). Vegetable tannins used in the manufacture of historic leathers. *Molecules*, *23*(5), 8–10. https://doi.org/10.3390/molecules23051081

Faradilla, M., & Rizal, K. (2023). Phytochemical screening analysis of Guava leaf extract (Psidium guajava L.) against the content of Saponins, Tannins, and Flavonoids. *Journal of Natural Sciences and Mathematics Research*, *9*(2), 117–126. https://doi.org/10.21580/jnsmr.2023.9.2.17835

Fass Robert. (1973). Morphology and ultrastructure of Staphylococcal L colonies: light, scanning, and transmission electron microscopy. *Journal Bacteriology*, *113*(2), 1049–1053.

Fauziah. (2014). *The study of food safety on meatball and cilok observed at several saler around of University of Jember: Viewed from Borax, Formalin and TPC*.

Fitri Zusi Eka, M. Fakih Kurniawan, I. K. (2021). Food safety analysis through identification of borax, formalin, Escherichia coli in fish meatballs in Tanjungpinang City. *Jurnal Agroindustri Halal*, *7*(2), 126–133.

Fitriyah, A. T., Setiawan, H. S., Halik, A., Baharuddin, B., Utami, R. R., & Afriyanto, M. M. (2022). PEMANFAATAN EKSTRAK DAUN JAMBU BIJI (Psidium guajava Linn) SEBAGAI BAHAN TAMBAHAN PADA PERMEN COKELAT TIRAMISU. *Jurnal Industri Hasil Perkebunan*, *17*(1), 1. https://doi.org/10.33104/jihp.v17i1.7685

Fitriyani. (2018). Jenis Dan Kandungan Antosianin Buah Tomi-Tomi. *Jurnal Teknologi Dan Industri Pangan*, *29*(2), 137–144. https://doi.org/10.6066/jtip.2018.29.2.137

Fitriyani, R., Ninan Lestario, L., & Martono, Y. (2018). Jenis Dan Kandungan Antosianin Buah Tomi-Tomi. *Jurnal Teknologi Dan Industri Pangan*, *29*(2), 137–144. https://doi.org/10.6066/jtip.2018.29.2.137

Fraga-Corral, M., García-Oliveira, P., Pereira, A. G., Lourenço-Lopes, C., Jimenez-Lopez, C., Prieto, M. A., & Simal-Gandara, J. (2020). Technological application of tannin-based extracts. *Molecules*, *25*(3), 1–27. https://doi.org/10.3390/molecules25030614

G, S., & Benny, P. V. (2010). Antibacterial potency of fruit extracts of Flacourtia

inermis against multidrug resistant strains and comparison of its activity with that of standard antibiotic. *International Journal Of Pharmaceutical Science And Biotechnology*, *1*(2), 96–99.

George, S., Benny, P. J., Kuriakose, S., & George, C. G. (2011). Antibiotic activity of 2, 3-dihydroxybenzoic acid isolated from Flacourtia inermis fruit against multidrug resistant bacteria. *Asian Journal of Pharmaceutical and Clinical Research*, *4*(1), 126–130.

Grossman, T. H. (2016). Tetracycline antibiotics and resistance. *Journal Medicine*, 1–24.

Halimu, R. B., S.Sulistijowati, R., & Mile, L. (2020). Identifikasi kandungan tanin pada Sonneratia alba. *Jurnal Ilmiah Perikanan Dan Kelautan*, *5*(4), 93–97.

Hanin & Pratiwi. (2017). *Kandungan Fenolik, Flavanoid Dan Aktivitas Antioksidan Ekstrak Daun Paku Laut (Acrostichum aureum) Fertil dan Steril.* (pp. 51–56). pp. 51–56. Retrieved from https://jurnal.ugm.ac.id/jtbb/article/view/29819/19331

Harborne. (1998). *Phytochemical Methods*.

Harlita, T. D., Anggrieni, N., Widya, A. F., Kesehatan, A., Kaltim, P. K., Kurnia, J., … Timur, K. (2019). Aktivitas dan efektivitas antibakteri esktrak daun Ciplukan (Physalis angulata L) terhadap pertumbuhan Bacillus cereus. *Jurnal Kesehatan "Husada Mahakam," V*(1), 51–60.

Hassan, M. M., Elrrigieg, M. A. A., Sabahelkhier, M., & Idris., O. (2016). Impacts of the Food Additive Benzoic Acid on Liver Function of Wistar Rats. *International Journal of Advanced Research*, *4*(8), 568–575. https://doi.org/10.21474/ijar01/1249

Hermanianto, J., Ratna, D., & Andayani, Y. (2002). Study of consumer behaviour and Identification of Meat Ball Characteristics Based on Consumer Preferences in DKI Jakarta. *Jurnal Teknologi Dan Industri Pangan*, *XIII*(1), 1–10.

Hidayah, N., 2016. (2016). *Pemanfaatan Senyawa Metabolit Sekunder Tanaman (Tanin dan Saponin) dalam Mengurangi Emisi Metan Ternak Ruminansia. 11*(2), 89–98.

Hidayah, N., Mustikaningtyas, D., & Bintari, S. H. (2017). Aktivitas antibakteri infusa simplisia Sargassum muticum terhadap tertumbuhan Staphylococcus aureus. *Life Science*, *6*(2), 49–54. Retrieved from http://journal.unnes.ac.id/sju/index.php/UnnesJLifeSci

Husain, R., Djafar, D., Yapanto, L. M., Sumber, J., Perairan, D., Perikanan, F., ... Gorontalo, U. N. (2021). *Bakso ikan tuna dengan penambahan tepung buah*

Lindur. *3*(2), 71–80.

Husain Yapanto, Lis Melissa Melissa, R., & Djafar, D. (2021). Analisis organoleptik mutu hedonik dan kimia bakso ikan tuna dengan penambahan tepung buah Lindur (Bruguiera gymnorrhiza). *Jambura Journal of Animal Science*, *3*(2), 71–80. https://doi.org/10.35900/jjas.v3i2.10287

Ikalinus, R., Widyastuti, S., & Eka Setiasih, N. (2015). Skrining Fitokimia Ekstrak Etanol Kulit Batang Kelor (Moringa oleifera). *Indonesia Medicus Veterinus*, *4*(1), 77.

Ikalinus, R., Widyastuti, S. K., Luh, N., Setiasih, E., Program, M., Dokter, P., ... Udayana, U. (2015). *Skrining Fitokimia Ekstrak Etanol Kulit Batang Kelor (Moringa oleifera)*. *4*(1), 71–79.

Istyami., Arif., Azziindi., P. (2024). Indonesian Journal of Chemical Research. *Indonesian Journal of Chemical Research*, *9*(2), 129–136. https://doi.org/10.30598//ijcr

Jaiswal, J., Siddiqi, N. J., Fatima, S., Abudawood, M., AlDaihan, S. K., Alharbi, M. G., ... Sharma, B. (2023). Analysis of biochemical and antimicrobial properties of bioactive molecules of Argemone mexicana. *Molecules*, *28*(11). https://doi.org/10.3390/molecules28114428

Jay M James, Loessner J Martin, G. A. D. (2005). *Modern Food Microbiology* (7th ed.; D. R. Heldman, Ed.). California, USA: Springer.

Jiménez-Ángeles, F., & Firoozabadi, A. (2018). Hydrophobic hydration and the effect of NaCl salt in the adsorption of ydrocarbons and surfactants on clathrate hydrates. *ACS Central Science*, *4*(7), 820–831. https://doi.org/10.1021/acscentsci.8b00076

Julianto, Nuzulia, A. (1967). Fitokimia. In *Angewandte Chemie International Edition, 6(11), 951–952.*

Kahiking T, Ansar N M, C. E. (2020). Nilai organoleptik bakso ikan Layang (Decapterus ruselli), ikan Kuniran (Upenus moluccensis) dan ikan Nila (Oreochromis niloticus). *Jurnal Ilmiah Tindalung*, *6*(2), 67–72.

Kapitan, L. A. V. (2017). Aktivitas antimikroba ekstrak Laos Putih (Alpinia Galangas) terhadap bakteri Escericia Coli dan Salmonella Sp. *Jurnal Info Kesehatan*, *15*(1), 14–20. https://doi.org/10.31965/infokes.vol15.iss1.124

Karanth, S., Feng, S., Patra, D., & Pradhan, A. K. (2023). Linking microbial contamination to food spoilage and food waste: the role of smart packaging, spoilage risk assessments, and date labeling. *Frontiers in Microbiology*, *14*(June), 1–17. https://doi.org/10.3389/fmicb.2023.1198124

Karwowska, M., & Kononiuk, A. (2020). Nitrates/nitrites in food–risk for nitrosative stress and benefits. *Journal Antioxidants*, *9*(3), 1–17. https://doi.org/10.3390/antiox9030241

Kauffmann, A. C., & Castro, V. S. (2023). Phenolic compounds in bacterial inactivation: a perspective from Brazil. *Antibiotics*, *12*(4), 1–24. https://doi.org/10.3390/antibiotics12040645

Keita, K., Darkoh, C., & Okafor, F. (2022). Secondary plant metabolites as potent drug candidates against antimicrobial-resistant pathogens. *SN Applied Sciences*, *4*(8). https://doi.org/10.1007/s42452-022-05084-y

Kim, J. H. (2017). Anti-bacterial action of onion (Allium cepa L.) extracts against oral pathogenic bacteria. *The Journal of Nihon University School of Dentistry*, *39*(3), 136–141. https://doi.org/10.2334/josnusd1959.39.136

Kubela, L., Moniharapon, E., & Tuhumury, H. C. D. (2023). Pengaruh konsentrasi gula terhadap karakteristik kimia dan organoleptik permen jelly buah tomi-tomi (Flacourtia inermis Roxb). *Jurnal Sains Dan Teknologi Pangan*, *8*(1). https://doi.org/10.33772/jstp.v8i1.29963

Lalopua, V. M. N. (2020). Rendemen Ekstrak Kasar dan Fraksi Pelarut Alga Merah (*Kappaphycus alvarezii* Doty). *Majalah BIAM*, *16*(1), 1–5.

Lemmens, R. H. M. J., Jansen, P. C. M., Siemonsma, J. S., & Stavast, F. M. . 1989. (n.d.). *Plant Resources of South-East Asia Basic list of species and commodity grouping*.

Li, N., Luo, M., Fu, Y., Zu, Y., Wang, W., Zhang, L., ... Sun, Y. (2019). Effect of corilagin on membrane permeability of Escherichia coli, Staphylococcus aureus and Candida albicans. *Phytotherapy Research*, *27*(10), 1517–1523.

Lisa, M., Lutfi, M., & Susilo, B. (2015). Pengaruh suhu dan lama pengeringan terhadap mutu tepung jamur tiram putih (Plaerotus ostreatus). *Jurnal Keteknikan Pertanian Tropis Dan Biosistem*, *3*(3), 270–279. Retrieved from https://jkptb.ub.ac.id/index.php/jkptb/article/view/293

Listiana, Wahlanto, Sintia, I. (n.d.). *Penetapan Kadar Tanin Dalam Daun Mangkokan (Nothopanax scutellarium Merr) Perasan Dan Rebusan Dengan Spektrofotometer UV-Vis*. *01*(01), 35–49.

Lobiuc, A., Pavăl, N. E., Mangalagiu, I. I., Gheorghiță, R., Teliban, G. C., Amăriucăi-Mantu, D., & Stoleru, V. (2023). Future antimicrobials: Natural and functionalized hhenolics. *Jounal Molecules*, *28*(3). https://doi.org/10.3390/molecules28031114

Machmud, H. K. K. N. (2015). Pengkayaan protein surimi Lele Dumbo pada brownies terhadap tingkat kesukaan. *Jurnal Perikanan Dan Kelautan*, *3*(3),

183–191.

Magani, A. K., Tallei, T. E., & Kolondam, B. J. (2020). Uji antibakteri nanopartikel kitosan terhadap pertumbuhan bakteri *Staphylococcus aureus* dan *Escherichia coli. Jurnal Bios Logos*, *10*(1), 7. https://doi.org/10.35799/jbl.10.1.2020.27978

Mailoa, M. N., Mahendradatta, M., Laga, A., & Djide, N. (2014). Antimicrobial activities of tannins extract from guava leaves (*Psidium guajava* L.) on pathogens microbial. *International Journal of Scientific \& Technology Research*, *3*(1), 236–241.

Makatambah, V., Fatimawali, F., & Rundengan, G. (2020). Analisis senyawa tannin dan aktifitas antibakteri fraksi buah sirih (*Piper betle* l) terhadap Streptococcus mutans. *Jurnal MIPA*, *9*(2), 75. https://doi.org/10.35799/jmuo.9.2.2020.28922

Malangngi, L., Sangi, M., & Paendong, J. (2012). Penentuan kandungan tanin dan uji aktivitas antioksidan ekstrak biji buah Alpukat (*Persea americana* Mill.). *Jurnal MIPA*, *1*(1), 5. https://doi.org/10.35799/jm.1.1.2012.423

Malanovic, N., & Lohner, K. (2016). Gram-positive bacterial cell envelopes: The impact on the activity of antimicrobial peptides. *Biochimica et Biophysica Acta - Biomembranes*, *1858*(5), 936–946. https://doi.org/10.1016/j.bbamem.2015.11.004

Mangunwardoyo', W., Ismaini' Dan Endang, L., & Heruwati, S. (2008). Analisis senyawa bio aktif dari ekstrak bui picung (*Pangium edule* Reinw.) segar [Analysis of bioactive compounds in fresh seed extract of picung {Pangium edule Reinw.)]. *Berita Biologi*, *9*(3), 259–264.

Maryam, S., Suhaenah, A., & Irmawan. (2023). Analisis kandungan senyawa fenolik dan tanin pada isolat fungi endofit (IFEBK20) bunga Kersen (*Muntibga cabura* L) dengan metode Spektrofotometri UV-Vis. *Makassar Pharmaceutical Science Journal*, *1*(2), 2023–2058. Retrieved from https://journal.farmasi.umi.ac.id/index.php/mpsj

Mawardi, Y. (2016). Kadar air, tanin, warna dan aroma off-flavour minuman fungsional daun sirsak (*Annona muricata*) dengan berbagai konsentrasi Jahe (*Zingiber officinale*). *Jurnal Aplikasi Teknologi Pangan*, *5*(3), 94–98. https://doi.org/10.17728/jatp.179

Menteri Kesehatan RI. (2012). *Bahan Tambahan Pangan*. *66*, 37–39.

Monteiro, J. M., Covas, G., Rausch, D., Filipe, S. R., Schneider, T., Sahl, H., & Pinho, M. G. (2019). *The pentaglycine bridges of Staphylococcus aureus peptidoglycan are essential for cell integrity*. (March), 1–10.

Montolalu S, L. N., & Sakul S, M. (2013). Sifat fisiko-kimia dan mutu organoleptik bakso broiler dengan menggunakan tepung ubi jalar (Ipomoea batatas L).

Jurnal Zootek, *32*(5), 1–13.

Mumpuni, F. S., & Hasibuan, S. (2018). Prevalensi mikroba pada produk pindang tongkol skala UKM Di pelabuhan ratu, Sukabumi. *Jurnal Pengolahan Hasil Perikanan Indonesia*, *21*(3), 480–485.

Mutha, R. E., Tatiya, A. U., & Surana, S. J. (2021). Flavonoids as natural phenolic compounds and their role in therapeutics: an overview. *Future Journal of Pharmaceutical Sciences*, *7*(1). https://doi.org/10.1186/s43094-020-00161-8

Mutiar, S., Kasim, A., Emriadi, E., & Asben, A. (2019). Studi awal tanin dari kulit kayu Acacia auriculiformis A. Cunn. ex Benth. dari hutan tanaman industri untuk bahan penyamak kulit. *Majalah Kulit, Karet, Dan Plastik*, *34*(2), 41. https://doi.org/10.20543/mkkp.v34i2.3967

Nawaz, H., Shad, M. A., Rehman, N., Andaleeb, H., & Ullah, N. (2020). Effect of solvent polarity on extraction yield and antioxidant properties of phytochemicals from bean (Phaseolus vulgaris) seeds. *Brazilian Journal of Pharmaceutical Sciences*, *56*. https://doi.org/10.1590/s2175-97902019000417129

Nendissa, S. J. (2023). Antibacterial inhibitory test of tomi-tomi fruit (Flacourtia iinermis Roxb) extracts against pathogenic bacteria in improving food safety. *IOP Conference Series: Earth and Environmental Science*, *1230*(1), 1–8. https://doi.org/10.1088/1755-1315/1230/1/012171

Nendissa, S. J., Mahendradatta, M., Zainal, & Bastian, F. (2021). Natural antibacterial and its use. *IOP Conference Series: Earth and Environmental Science*, *755*(1). https://doi.org/10.1088/1755-1315/755/1/012059

Nendissa Sandriana J. Mahendradatta M, Zainal, B. F. (2024). Enchaning tuna fish meatballs quality through the incorporation of tannin extract from tomi-tomi fruit (Flacourtia inermis). *Advances in Animal and Veterinary Sciences*, *Vol. 12*(4), 742–748.

Ngo, T. Van, Scarlett, C. J., Bowyer, M. C., Ngo, P. D., & Vuong, Q. Van. (2017). Impact of different extraction solvents on bioactive compounds and antioxidant capacity from the root of Salacia chinensis L. *Journal of Food Quality*, *2017*. https://doi.org/10.1155/2017/9305047

Novak Babič, M., Gostinčar, C., & Gunde-Cimerman, N. (2020). Microorganisms populating the water-related indoor biome. *Applied Microbiology and Biotechnology*, *104*(15), 6443–6462. https://doi.org/10.1007/s00253-020-10719-4

Noviyanty, A., Salingkat, C. A., & Syamsiar, S. (2019). Pengaruh jenis pelarut terhadap ekstraksi dari kulit buah naga merah (*Hylocereus polyrhizus*). *KOVALEN: Jurnal Riset Kimia*, *5*(3), 271–279.

https://doi.org/10.22487/kovalen.2019.v5.i3.14037

Noviyanty, Y., & Linda, A. M. (2020). Profil fitokimia senyawa metabolit sekunder ekstrak etanol bunga senduduk (*Melastoma malabathricum* L). *Journal of Pharmaceutical And Sciences*, *3*(1), 1–6. https://doi.org/10.36490/journal-jps.com.v3i1.34

Nugraha Aditya Cahya , Agung Tri Prasetya, dan S. M. (2017). Isolasi, identifikasi, uji Aktivitas senyawa flavonoid sebagai antibakteri dari daun Mangga. *Indonesia Journal Of Chemical Sicience*, *6*(2).

Nurhuda, H. S., Junianto, & Rochima, E. (2017). Penambahan tepung karaginan terhadap tingkat kesukaan bakso ikan Manyung. *Jurnal Perikanan Dan Kelautan*, *8*(1), 157–164.

Nurmila, N., Sinay, H., & Watuguly, T. (2019). Identifikasi dan analisis kadar flavonoid ekstrak getah angsana (pterocarpus indicus willd) di dusun Wanath Kecamatan Leihitu Kabupaten Maluku Tengah. *Biopendix: Jurnal Biologi, Pendidikan Dan Terapan*, *5*(2), 65–71. https://doi.org/10.30598/biopendixvol5issue2page65-71

P.V, Benny; Shibu, G. (2011). *Antifungal activity of acetonic extract of flacourtia inermis againts oppertunistic pathogenics fungi*. (February), 103–106.

Pamungkas, J. D., Anam, K., & Kusrini, D. (2016). Penentuan Total Kadar Fenol dari Daun Kersen Segar , Kering dan. *Journal of Scientific and Applied Chemistry*, *19*(1), 15–20.

Panche, A. N., Diwan, A. D., & Chandra, S. R. (2016). Flavonoids: An overview. *Journal of Nutritional Science*, *5*. https://doi.org/10.1017/jns.2016.41

Pancu, D. F., Scurtu, A., Macasoi, I. G., Marti, D., Mioc, M., Soica, C., … Dehelean, C. (2021). Antibiotics: Conventional therapy and natural compounds with antibacterial activity-a pharmaco-toxicological screening. *Journal Antibiotics*, *10*(4). https://doi.org/10.3390/antibiotics10040401

Pandey, A., & Tripathi, S. (2014). Concept of standardization, extraction and pre phytochemi... - Google Scholar. *Journal of Pharmacognosy and Phytochemistry*, *2*(5), 115–119.

Pandjo, S. S. K., Mustapa, K., & Ningsih, P. (2021). Antioxidant Activity Test of Acetone and Ethanol Extracts of Cocoa (Theobroma cacao L.) Beans Husk. *Jurnal Akademika Kimia*, *10*(1), 1–8. https://doi.org/10.22487/j24775185.2021.v10.i1.pp1-8

Patel, K., Panchal, N., & Ingle, P. (2019). Review of extraction techniques extraction methods: microwave, ultrasonic, pressurized fluid, soxhlet extraction, Etc. *International Journal of Advanced Research in Chemical Science*, *6*(3), 6–21.

https://doi.org/10.20431/2349-0403.0603002

Pathan, A. K., Bond, J., & Gaskin, R. E. (2009). Sample preparation for SEM of plant surfaces Plant tissues must be dehydrated for observation in most electron. *Materials Today*, *12*, 32–43. Retrieved from http://dx.doi.org/10.1016/S1369-7021(10)70143-7

Pelima, J. N. (2016). The study of *Flacourtia inermis* Roxb crop development. *Jurnal Envira Vol . 1 No . 1 Juni 2016 ISSN 2528-6439 Aspek Pengembangbiakan*. *1*(1), 34–39.

Pérez, M., Dominguez-López, I., & Lamuela-Raventós, R. M. (2023). The Chemistry Behind the Folin-Ciocalteu Method for the Estimation of (Poly)phenol Content in Food: Total Phenolic Intake in a Mediterranean Dietary Pattern. *Journal of Agricultural and Food Chemistry*, *71*(46), 17543–17553. https://doi.org/10.1021/acs.jafc.3c04022

Pinto, L., Tapia-Rodríguez, M. R., Baruzzi, F., & Ayala-Zavala, J. F. (2023). Plant antimicrobials for food quality and safety: Recent views and future challenges. *Foods*, *12*(12). https://doi.org/10.3390/foods12122315

Pizzi, A. (2021). Tannins medical / pharmacological and related applications: A critical review. *Sustainable Chemistry and Pharmacy*, *22*. https://doi.org/10.1016/j.scp.2021.100481

Pontoh, F. W., Sanger, G., Kaseger, B. E., Wonggo, D., Montolalu, R. I., Damongilala, L. J., & Makapedua, D. M. (2019). Kandungan fitokimia, kadar total fenol dan aktivitas antioksidan ekstrak rumput laut (*Halymenia durvillae)*. *Media Teknologi Hasil Perikanan*, *7*(3), 62. https://doi.org/10.35800/mthp.7.3.2019.23615

Pramudita, M., Juliansyah, H., & Rizki, M. A. (2014). Ekstrak kulit manggis (*Garcinia mangostana* L) sebagai inhibitor korosi baja lunak (mild steel) dalam larutan H2SO4 1 M. *Teknika: Jurnal Sains Dan Teknologi*, *10*(1), 1. https://doi.org/10.36055/tjst.v10i1.6629

Pramuditya Galih, & Yuwono Sudarmanto Setyo. (2014). Determination of meatball texture quality attribute as an additional requirement in SNI and the effect of heating time on meatball texture. *Jurnal Pangan Dan Agroindustri*, *2*(4), 200–209.

Prihharsanti, A. H. T. (2019). Populasi bakteri dan jamur pada daging sapi dengan penyimpanan suhu rendah. *Sains Peternakan*, *7*(2), 66. https://doi.org/10.20961/sainspet.v7i2.1060

Principle, A., & Apparatus, B. (2005). Of fi cial Methods of Anal y sis of AOAC IN TER NA TIONAL 18th Edi tion, 2005. *Of Fi Cial Methods of Anal y Sis of AOAC IN TER NA TIONAL 18th Edi Tion, 2005*, (d), 4–5. Retrieved from

https://www.academia.edu/43245633/Of_fi_cial_Methods_of_Anal_y_sis_of_AOAC_IN_TER_NA_TIONAL_18th_Edi_tion_2005

Pullen, J., & Great Britain. Environment Agency. (2007). *Review of odour character and thresholds*.

Purnomo H, R. D. (2008). Indonesian Traditional Meatball. *International Food Research Journal*, *15*(2), 101–108.

Purukan O P M, Mamuaja C F, Mandey L C, M. L. P. (2013). Pengaruh penambahan bubur wortel (Daucus carrota) dan tepung tapioka terhadap sifat fisikokimia dan sensoris bakso ikan Gabus. *Agrikan*.

Purwanto, R. O. A. B. D. H. M. B. (2013). The effect of variations in the composition of glucose syrup and drying temperature on physico - chemical and sensory properties of "Dodol Rumput Laut" (Eucheuma spinosium). *JOurnal Bioproses Komoditas Tropis*, *1*(1), 1–12.

Ruiz-Capillas, C., & Herrero, A. M. (2021). Sensory analysis and consumer research in new product development. *Foods*, *10*(3), 2–5. https://doi.org/10.3390/foods10030582

Ruwandha, D., Fitriyani, D., & Iskandar, D. (2021). UJI AKTIVITAS TANIN DAUN MIMBA (Azzadirachta indica) TERHADAP BAKTERI Salmonella typhi. *Jurnal Kimia Riset*, *6*(1), 77. https://doi.org/10.20473/jkr.v6i1.24848

Sadiah, H. H., Cahyadi, A. I., Windria, S., Program, M., Kedokteran, S., Mikrobiologi, D., ... Barat, J. (2022). A review green betel leaf (Piper betle L) potency as antibacterial. *Jurnal Saiin Veteriner*, *40*(2), 128–138.

Sakti Hariyanto; Lestari Sus; Supriadi Agus. (2016). Quality changes of smoked snakehead fish (Channa striata) during storage. *Jurnal Teknologi Hasil Perikanan*, *5*(1), 11–18.

Salaki, C. L. (2011). Isolation and characterization indigenous bacteria (Bacillus cereus Frank0 for against cabbage. *Journal Eugenia*, *17. No.1*, 10–15.

Salmiyah S, B. A. (2018). 50 10,94. *Hospital Majapahit*, *10*(1), 43–50.

Salmiyah S Baharudidin. (2018). Fitikimia dan antioksidan pada buah Tome-Tome (Flacourtia inermis). *Jurnal Hospital Majapahit*, *Vol. 10. N*, 43–50.

Samarajeewa, U. (2024). Safety, processing, and utilization of fishery products. *Fishes*, *9*(4). https://doi.org/10.3390/fishes9040146

Sari, P. P., Rita, W. S., & Puspawati, N. M. (2015). Identifikasi dan uji aktivitas senyawa tanin dari ekstrak daun trembesi (*Samanea saman* (Jacq.) Merr) Sebagai Antibakteri *Escherichia coli*. *Jurnal Kimia*, *9*(1), 27–34.

Savithramma, N., Rao, M.L., & Suhrulatha, D. (2011). *Screening of medicinal plants for secondary metabolites. 8(3), 579_584.* (January 2011).

Sayuti, M. (2017). Pengaruh perbedaan metode ekstraksi, bagian dan jenis pelarut terhadap rendemen dan aktifitas antioksidan bambu laut *(Isis hippuris*). *Technology Science and Engineering Journal*, *1*(3), 2549–1601.

Seidel, V. (2008). Initial and Bulk Extraction. In *Natural Products Isolation*. https://doi.org/10.1385/1-59259-955-9:27

Sheng, L., & Wang, L. (2021). The microbial safety of fish and fish products: Recent advances in understanding its significance, contamination sources, and control strategies. *Comprehensive Reviews in Food Science and Food Safety*, *20*(1), 738–786. https://doi.org/10.1111/1541-4337.12671

Shibumon, G., & Benny, P. J. (2010). Antiprotozoal activity of the crude extract of *Flacourtia inermis* fruit by microscopic count method. *International Journal of Pharmaceutical & Biological Archive*, *1*(4), 385–388. Retrieved from http://ijpba.info/ijpba/index.php/ijpba/article/view/134%5Cnhttp://ijpba.info/ijpba/index.php/ijpba/article/viewFile/134/106

Shibumon George, & Benny, P. V. (2010). Antibacterial potency of fruit extracts of Flacourtia inermis against multidrug resistant strains and comparison of its activity with that of standard antibiotic. *International Journal Of Pharmaceutical Science And Biotechnology*, *1*(2), 96–99.

Siahaan, E. M. I., Santoso, B. B., Somar, E., & Massora, M. (2021). Antibacterial activity test and phytochemical screening of black fruit methanol extract (H . Monticola) from Teluk Wondama. *Jurnal Natural*, *17*(2), 72–84.

Silaban, M., Herawati, N., & Zalfiatri, Y. (2017). The effect of adding bamboo shoots Betung in manufactiring catfish (Pangasius hypopthanamus nugget. *Jurnal Online Mahasiswa Fakultas Pertanian Universitas Riau*, *4*(2), 1–13.

Silaban, Y. W., Suketi, K., Susanto, S., & Matra, D. D. (2021). Isolation and characterization genes in lobi-lobi (Flacourtia inermis) related to sugar metabolism. *IOP Conference Series: Earth and Environmental Science*, *694*(1). https://doi.org/10.1088/1755-1315/694/1/012068

Silalahi., M. S. R. Y. (2020). Antibacterial activity extract of Leaves of Kaffir Lime (*Citrus hystrix* DC) Againts of Staphylococcus aureus Bacteria Aktivitas Antibakteri Ekstrak Daun Jeruk Purut (*Citrus hystrix* DC) Terhadap Bakteri Staphylococcus aureus. *Jurnal Pembelajaran Dan Biologi Nukleus*, *6*(September), 129–138.

Sirag, N., Ahmed, E. M., Algaili, A. M., & Hassan, H. M. (2013). Antibacterial activity of Roselle (Hibiscus Sabdariffa L) calyx extract. *International Journal of Indigenous Medicinal Plants*, *46*(4), 1487–1491.

SNI. (2006). Petunjuk Pengujian Organoleptik dan atau Sensori 01-2346-2006. *BSN (Badan Standarisasi Nasional)*, 2–14.

Soares, S., Brandão, E., Guerreiro, C., Soares, S., Mateus, N., & De Freitas, V. (2020). Tannins in food: Insights into the molecular perception of astringency and bitter taste. *Molecules*, *25*(11), 1–26. https://doi.org/10.3390/molecules25112590

Sperber, W. H. (2019). Influence of water activity on foodborne bacteria — A Review. *Journal of Food Protection*, *46*(2), 142–150. https://doi.org/10.4315/0362-028x-46.2.142

Sri Irianty, R., & Yenti, S. R. (2014). Pengaruh perbandingan pelarut etanol-air terhadap kadar tanin pada sokletasi daun gambir (*Uncaria gambir* Roxb). *Sagu*, *13*(1), 1–7.

Srihari, E., Lingganingrum, F. S., Damaiyanti, D., & Natalia, F. (2019). Ekstrak bawang putih bubuk dengan menggunakan proses spray drying. *Jurnal Teknik Kimia*, *2*(1), 62–68.

Stroppel, L., Schultz-Fademrecht, T., Cebulla, M., Blech, M., Marhöfer, R. J., Selzer, P. M., & Garidel, P. (2023). Antimicrobial preservatives for protein and peptide formulations: An Overview. *Journal Pharmaceutics*, *15*(2), 1–53. https://doi.org/10.3390/pharmaceutics15020563

Subaryanti, S., Triadiati, T., Sulistyaningsih, Y. C., & Pradono, D. I. (2022). Total phenol content of accessions of Kencur (Kaempferia galanga L.) at different altitudes. *Natural Science: Journal of Science and Technology*, *11*(01), 1–6. https://doi.org/10.22487/25411969.2022.v11.i01.15696

Sudarwati Dwi, S. W. (2016). Uji Aktivitas Senyawa Antibakteri Pada Ekstrak Daun Kelor Dan Bunga Rosella. *Indonesia Journsl of Chemical Science*, *5*(1), 11–14.

Sunani, S., & Hendriani, R. (2023). Review Jurnal : Klasifikasi dan aktivitas farmakologi dari senyawa aktif tanin. *Indonesian Journal of Biological Pharmacy*, *3*(2), 130. https://doi.org/10.24198/ijbp.v3i2.44297

Sunardi. (2023). Analisis gugus fungsi dan penentuan kadar total fenol ekstrak kulit buah naga merah dan putih.*Jurnal pendidikan kimia dan ilmu kimia*, *6*(1),8–18.

Sundu, R., Supriningrum, R., & Fatimah, N. (2022). Kandungan total senyawa fenol , total senyawa flavonoid dan aktivitas antioksidan ektsrak etanol kulit batang sekilang (*Embelia borneensis* Scheff .) Total phenolic content , total flavonoid content and antioxidant activity of ethanol extract of sekilang. *Bivalen ; Chemical Studies Journal*, *5*(November), 31–36.

Susila Ningsih, I., Chatri, M., & Advinda, L. (2023). Flavonoid Active Compounds Found In Plants Senyawa Aktif Flavonoid yang Terdapat Pada Tumbuhan. *Serambi Biologi*, *8*(2), 126–132.

Swangi, O. F., & Priacanthus, F. (2022). Consumer acceptance and quality star fish balls of swangi fish (*Priacanthus tayenus*). *Journal RJOAS*, *8*(August), 195–200. https://doi.org/10.18551/rjoas.2022-08.26

Taip., P. J. A. U. C. B. P. M. (2022). Uji aktivitas antibakteri ekstrak etanol daun Tapak Dara (*Catharantus roseus)* terhadap pertumbuhan bakteri Staphylococcus aureus dengan menggunakan metode difusi agar. *Rumpun Ilmu Kesehatan*, *2*(1), 80–90.

Tiwari, B. K., Valdramidis, V. P., O'Donnell, C. P., Muthukumarappan, K., Bourke, P., & Cullen, P. J. (2009). Application of natural antimicrobials for food preservation. *Journal of Agricultural and Food Chemistry*, *57*(14), 5987–6000. https://doi.org/10.1021/jf900668n

Tong, Z., He, W., Fan, X., & Guo, A. (2022). Biological Function of Plant Tannin and Its Application in Animal Health. *Frontiers in Veterinary Science*, *8*(January), 1–7. https://doi.org/10.3389/fvets.2021.803657

Truong, D. H., Ta, N. T. A., Pham, T. V., Huynh, T. D., Do, Q. T. G., Dinh, N. C. G., ... Bui, A. V. (2021). Effects of solvent–solvent fractionation on the total terpenoid content and in vitro anti-inflammatory activity of Serevenia buxifolia bark extract. *Food Science and Nutrition*, *9*(3), 1720–1735. https://doi.org/10.1002/fsn3.2149

Tungmunnithum, D., Thongboonyou, A., Pholboon, A., & Yangsabai, A. (2018). Flavonoids and other phenolic compounds from medicinal plants for pharmaceutical and medical aspects: An Overview. *Medicines*, *5*(3), 93. https://doi.org/10.3390/medicines5030093

Tutuhatunewa, A. (2020). Analisis kualitas produk abon ikan dengan pendekatan logika fuzzy. *ARCHIPELAGO ENGINEERING*, *3*, 24–32. https://doi.org/10.30598/ale.3.2020.24-32

Vaou, N., Stavropoulou, E., Voidarou, C., & Tsigalou, C. (2021). Towards advances in medicinal plant antimicrobial activity : A Review study on challenges and future perspectives. *Journal Microorganisms*, *9*, 1–28.

Vasconcelos, N. G., Croda, J., & Simionatto, S. (2018). Antibacterial mechanisms of cinnamon and its constituents: A review. *Microbial Pathogenesis*, *120*(March), 198–203. https://doi.org/10.1016/j.micpath.2018.04.036

Vera Zambrano, M., Dutta, B., Mercer, D. G., MacLean, H. L., & Touchie, M. F. (2019). Assessment of moisture content measurement methods of dried food products in small-scale operations in developing countries: A review. *Trends in*

Food Science and Technology, *88*(July 2018), 484–496. https://doi.org/10.1016/j.tifs.2019.04.006

Wahyuni, S., Vifta, R. L., & Erwiyani, A. R. (2018). Kajian aktivitas antibakteri ekstrak etanol daun jati Belanda (Guazuma ulmifolia Lamk) terrhadap pertumbuhan Streptococcus mutans. *Jurnal Inovasi Teknik Kimia*, *3*(1), 25–30. https://doi.org/10.31942/inteka.v3i1.2122

Wang, Y., Wu, J., Lv, M., Shao, Z., Hungwe, M., Wang, J., ... Geng, W. (2021). Metabolism characteristics of lactic acid bacteria and the expanding applications in food industry. *Frontiers in Bioengineering and Biotechnology*, *9*(May), 1–19. https://doi.org/10.3389/fbioe.2021.612285

Wibowo, M. A., Sari, D. N., & Jayuska, A. (2021). Bioactive composition and antibacterial activities test of Cajuput Leaf Essential Oil (Melaleuca cajuputi) from the City of Singkawang. *Jurnal Biopropal Industri*, *12*(1), 1–7.

Widiawati, W., & Lailatul Qodri, U. (2023). Analisis Fitokimia Dan Penentuan Kadar Fenolik Total Pada Ekstrak Etanol Tebu Merah Dan Tebu Hijau (Saccharum officinarum L.). *Jurnal Farmasi Tinctura*, *4*(2), 91–102. https://doi.org/10.35316/tinctura.v4i2.3175

Winda, F. R., Suparno, S., & Prasetyo, Z. K. (2023). Antibacterial activity of Cinnamomum burmannii Extract Against Escherichia coli. *Jurnal Penelitian Pendidikan IPA*, *9*(11), 9162–9170. https://doi.org/10.29303/jppipa.v9i11.4045

Wong, F., & Amir, A. (2019). Mechanics and dynamics of bacterial cell lysis. *Biophysical Journal*, *116*(12), 2378–2389. https://doi.org/10.1016/j.bpj.2019.04.040

Xue, T., & Yang, L. (2016). The Toxicity Assessment of ethyl p-hydroxybenzoate in Nematode C. elegans. *International Journal of Biology*, *8*(3), 38. https://doi.org/10.5539/ijb.v8n3p38

Yan, Y., Li, X., Zhang, C., Lv, L., Gao, B., & Li, M. (2021). Research progress on antibacterial activities and mechanisms of natural alkaloids : A Review. *Journal Antiboitics*, *Vol. 10. N*.

Yennie Y, Hariyadi R D, Kusumaningrum H D, P. A. (2022). Kontaminasi Staphylococcus aureus dan Bacillus cereus di tingkat ritel di wilayah Jabotabek. *Jurnal JPHPI*, *25*(2), 331–344.

Yosi, F., Sari, M. L., & . R. (2017). Pengaruh konsentrasi tanin dalam larutan limbah bubuk teh hitam terhadap susut bobot, tekstur, dan kemasiran telur asin itik pegagan. *Jurnal Peternakan Sriwijaya*, *6*(2), 91–99. https://doi.org/10.33230/jps.6.2.2017.5084

Yuniharni, D., Marpaung, L., & Lenny, S. (2021). Uji aktivitas antibakteri senyawa flavonoid total dan tanin total dari ekstrak daun jambu monyet (Anacardium occidentale . L). *Jurnal Kimia Sains Dan Terapan*, *3*(April), 30–37.

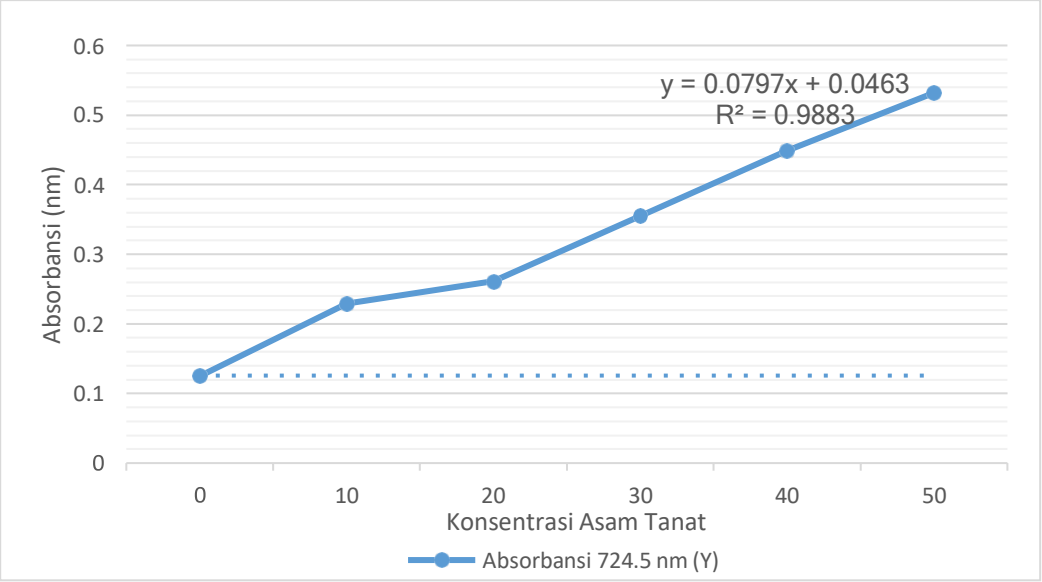
Zhang, Q. W., Lin, L. G., & Ye, W. C. (2018). Techniques for extraction and isolation of natural products: A comprehensive review. *Chinese Medicine (United Kingdom)*, *13*(1), 1–26. https://doi.org/10.1186/s13020-018-0177-x

LAMPIRAN

Lampiran 1. Kurva Standar Asam Tanat (mg/g)

Standar Asam Tanat

Konsentrasi	Absorbansi 724.5 nm
0	0,125
10	0, 229
20	0, 261
30	0, 355
40	0, 449
50	0, 532



Kurva Hubungan Antara Konsentrasi Asam Tanat (µg/ml) Dengan Absorbansi

Lampiran 2. Hasil Pengujian Kadar Total Tanin Pada Buah Tomi-Tomi

Pelarut	Ulangan			Jumlah	Rataan (mg/g)
	1	2	3		
Etanol 25%	1,142	1,125	1,159	3,426	1,142
Etanol 50%	1,223	1,258	1,185	3,666	1,222
Etanol 75 %	3,589	3,688	3,764	11,041	3,680
Aseton 25%	0,037	0,244	0,151	0,432	0,144
Aseton 50%	0,632	0,853	0,561	2,046	0,682
Aseton 75 %	1,039	1,011	1,012	3,062	1,021

Lampiran 3. Tabel Diameter Penghambatan Bakteri Patogen (mm)

Konsentrasi	Ulangan	S1	S2	S3
1	1	23,74	21,68	21,03
1	2	23,78	22,41	21,16
1	3	23,88	22,58	21,26
2	1	29,89	32,42	25,77
2	2	29,96	34,55	25,73
2	3	30,15	34,75	25,61
3	1	38,83	33,36	32,59
3	2	39,06	34,44	32,81
3	3	39,12	34,23	32,71

Ket ; S1 = *Staphylococcus aureus,* S2 = *Bacillus cereus,* S3 = *Salmonella typhimurium*

Lampiran 4. Analisis Varians Diameter Zona Hambat Bakteri *Staphylococcus aureus*.

Sumber	DB	JK	KT	Fit	P
Konsentrasi	2	418,059	209,029	79,314**	0,000
Acak	7	10,542	1,506		
Total	9	407,517			

Lampiran 5 Analisis Varians Diameter Zona Hambat Bakteri *Bacilus cereus*.

Sumber	DB	JK	KT	Fit	P
Konsentrasi	2	306,75	153,387	477,297**	0,000
Acak	7	1,285	0,183		
Total	9	305,465			

Lampiran 6. Analisis Varians Diameter Zona Hambat Bakteri *Salmonella typhimurium*

Sumber	DB	JK	KT	Fit	P
Konsentrasi	2	206,749	103,374	210,806**	0,000
Acak	7	1,962	0,280		
Total	9	443,735			

Lampiran 7. Uji Duncan Diameter Hambat Bakteri *Staphylococcus aureus* Pada Perlakuan Konsentrasi Ekstrak (K) Tanin Buah Tomi-Tomi

K	N	Subset		
		1	2	3
25%	3	23,80		
50%	3		30,00	
75%	3			39,00
Sig		1,000	1,000	1,000

Lampiran 8. Uji Duncan Diameter Penghambatan Bakteri *Bacillus cereus* Pada Perlakuan Konsentrasi Ekstrak (K) Tanin Buah Tomi-Tomi

K	N	Subset	
		1	2
25%	3	22,22	
50%	3		33,90
75	3		34,01
Sig		1.000	0,050

Lampiran 9. Uji Duncan Diameter Penghambatan Bakteri *Salmonella typhimurium* Pada Perlakuan Konsentrasi Ekstrak (K) Tanin Buah Tomi-Tomi

K	N	Subset		
		1	2	3
25%	3	21,15		
50%	3		25,7033	
75	3			32,70
Sig		1,000	1,000	1,000

Lampiran 10. Analisis Varians Nilai Total Bakteri Bakso Ikan Tuna Penyimpanan Suhu Ruang

Sumber	DB	JK	KT	Fit	P
Konsentrasi	3	14,751	4,917	140,434**	0,000
Waktu	5	111,447	22,289	636,585**	0,000
K*W	15	11,680	0,779	22,240**	0,000
Acak	48	1,681	0,035		
Total	71				

Lampiran 11. Analisis Varians Nilai Total Bakteri Bakso Ikan Tuna Penyimpanan Suhu Refrigerator

Sumber	DB	JK	KT	Fit	P
Konsentrasi	3	40,706	13,569	331,014**	0,000
Waktu	5	109,445	21.889	533,988**	0,000
K*W	15	10,969	0,731	17,839**	0,000
Acak	48	1,968	0,041		
Total	71				

Lampiran 12. Analisis Varians pH Bakso Ikan Tuna Penyimpanan Suhu Ruang

Sumber	DB	JK	KT	Fit	P
Konsentrasi	3	2,419	0,806	228,709**	0,000
Waktu	5	1,363	0,273	77,344**	0,000
K*W	15	0,290	0,19	5,491**	0,000
Acak	48	0,169	0,04		
Total	71				

Lampiran 13. Analisis Varians pH Bakso Ikan Tuna Penyimpanan Suhu Refrigerator

Sumber	DB	JK	KT	Fit	P
Konsentrasi	3	11,413	3,804	1052,255**	0.000
Waktu	5	3,181	0,676	187,058**	0.000
K*W	15	1,418	0,095	26,141**	0.000
Acak	48	0,174	0,04		
Total	71				

Lampiran 14 Analisis Varians Nilai Kadar Air Bakso pada Penyimpanan Suhu Ruang

Sumber	DB	JK	KT	Fit	P
Konsentrasi	3	501,27	167,090	13284,539**	0,000
Waktu	5	133,202	26,640	2118,059**	0,000
K*W	15	52,588	3,506	278,734**	0,000
Acak	48	0,604	0,013		
Total	71	687,124			

Lampiran 15. Analisis Varians Nilai Kadar Air Bakso Pada Penyimpanan Suhu Refrigerator

Sumber	DB	JK	KT	Fit	P
Konsentrasi	3	321,411	107.137	2672.854**	0.000
Waktu	5	688,919	137.784	3437.436**	0.000
K*W	15	27,036	1.802	44.967**	0.000
Acak	48	1,924	0.040		
Total	71	2183,964			

Lampiran 16. Analisis Varians Nilai Kadar Protein Bakso Ikan Tuna Penyimpanan Suhu Ruang

Sumber	DB	JK	KT	Fit	P
Konsentrasi	3	253,914	84,638	292,192**	0,000
Waktu	5	86,907	17,381	60,005**	0,000
K*W	15	34,960	2,331	8,046**	0,000
Acak	48	13,614	0,290		
Total	71				

Lampiran 17. Analisis Varians Nilai Kadar Protein Bakso Pada Penyimpanan Suhu Refrigerator

Sumber	DB	JK	KT	Fit	P
Konsentrasi	3	299,930	99,977	6732,437**	0,000
Waktu	5	228,655	45,731	3079,533**	0,000
K*W	15	191,9647	1,310	44,967**	0,000
Acak	48	1,924	0,15		
Total	71	2183,964			

Lampiran 18. Uji Duncan Interaksi Perlakuan Konsentrasi Ekstrak (K) dan Waktu Pengamatan (W) Terhadap Total Bakteri Pada Bakso Ikan Tuna Yang direndam Dengan Ekstrak Tanin Selama Penyimpanan Suhu Ruang

Perlakuan	Nilai Rataan/Beda
K0*W0	5,63b
K0*W7	5,41c
K0*W14	5,27d
K0*W21	4,82e
K0*W28	5,60b
K0*W35	6,05a
K1*W0	5,49a
K1*W7	4,40b
K1*W14	4,26c
K1*W21	4,15d
K1*W28	4.08e
K1*W35	4,00e
K1.5*W0	5,25a
K1.5*W7	4,25b
K1.5*W14	4,02c
K1.5*W21	3,88d
K1.5*W28	3,71e
K1.5*W35	3,55f
K2*W0	5,01a
K2*W7	4,00b
K2*W14	3,77c
K2*W21	3,41d
K2*W28	3,26e
K2*W35	3,04f

Keterangan; Angka yang diikuti dengan huruf yang sama dalam kolom yang sama, tidak berbeda nyata pada taraf uji Duncan = 0.05

Lampiran 19. Uji Duncan Interaksi Perlakuan Konsentrasi Ekstrak (K) dan Waktu Pengamatan (W) Terhadap Total Bakteri Pada Bakso Ikan Tuna Yang direndam Dengan Ekstrak Tanin Selama Penyimpanan Suhu Refrigerator

Perlakuan	Nilai Rataan/Beda
K0*W0	5,58a
K0*W3	5,47b
K0*W6	5,20c
K0*W9	4,50d
K0*W12	4,04e
K0*W15	3,75f
K1*W0	5,50a
K1*W3	5,06b
K1*W6	4,53c
K1*W9	3,85d
K1*W12	3,17e
K1*W15	2,50f
K1.5*W0	5,42a
K1.5*W7	4,47b
K1.5*W14	4,03c
K1.5*W21	3,13d
K1.5*W28	2,10e
K1.5*W35	1,03f
K2*W0	5,28a
K2*W14	4,00b
K2*W21	3,40c
K2*W28	2,50d
K2*W35	1,43e
K2*W7	1,20f

Keterangan; Angka yang diikuti dengan huruf yang sama dalam kolom yang sama, tidak berbeda nyata pada taraf uji Duncan = 0.05

Lampiran 20. Uji Duncan Interaksi Perlakuan Konsentrasi Ekstrak (K) dan Waktu Pengamatan (W) Terhadap pH pada Bakso Ikan Tuna Yang direndam dengan Ekstrak Tanin Selama Penyimpanan Suhu Ruang

Perlakuan	Nilai Rataan/Beda
K0*W0	5,91a
K0*W7	5,84b
K0*W14	5,72c
K0*W21	5,67d
K0*W28	5,73c
K0*W35	5,82a
K1*W0	5,75a
K1*W7	5,64b
K1*W14	5,55c
K1*W21	5,44d
K1*W28	5,34e
K1*W35	5,26f
K1.5*W0	5,63a
K1.5*W7	5,56b
K1.5*W14	5,45c
K1.5*W21	5,34d
K1.5*W28	5,25e
K1.5*W35	5,16f
K2*W0	5,54a
K2*W7	5,43b
K2*W14	5,33c
K2*W21	5,24d
K2*W28	5,15e
K2*W35	5,04f

Keterangan; Angka yang diikuti dengan huruf yang sama dalam kolom yang sama, tidak berbeda nyata pada taraf uji Duncan = 0.05

Lampiran 21. Uji Duncan Interaksi Perlakuan Konsentrasi Ekstrak (K) dan Waktu Pengamatan (W) Terhadap pH pada Bakso Ikan Tuna Yang direndam dengan Ekstrak Tanin Selama Penyimpanan Suhu Refrigerator

Perlakuan	Nilai Rataan/Beda
K0*W0	6,06a
K0*W3	6,15a
K0*W6	5,84b
K0*W9	5,63c
K0*W12	5,50d
K0*W15	5,37e
K1*W0	5,65a
K1*W3	5,54b
K1*W6	5,45c
K1*W9	5,34d
K1*W12	5,26e
K1*W15	5,15f
K1.5*W0	5,54a
K1.5*W3	5,44b
K1.5*W6	5,25c
K1.5*W9	5,06d
K1.5*W12	4,96e
K1.5*W15	4,86ff
K2*W0	5,42a
K2*W3	5,26b
K2*W6	5,07c
K2*W9	4.86d
K2*W12	4,65e
K2*W15	4,52f

Keterangan; Angka yang diikuti dengan huruf yang sama dalam kolom yang sama, tidak berbeda nyata pada taraf uji Duncan = 0.05

Lampiran 23. Uji Duncan Interaksi Perlakuan Konsentrasi Ekstrak (K) dan Waktu Pengamatan (W) Terhadap Kadar Air pada Bakso Ikan Tuna Yang direndam dengan Ekstrak Tanin Selama Penyimpanan Suhu Ruang

Perlakuan	Nilai Rataan/Beda
K0*W0	60,22a
K0*W7	58,45ab
K0*W14	57,64b
K0*W21	59,57a
K0*W28	60,34a
K0*W35	59,56a
K1*W0	58,64ab
K1*W7	56,64b
K1*W14	56,44b
K1*W21	55,30c
K1*W28	54,65c
K1*W35	53,26d
K1.5*W0	57,45b
K1.5*W7	56,85b
K1.5*W14	54,75c
K1.5*W21	53,35d
K1.5*W28	52,53d
K1.5*W35	51,42e
K2*W0	54,73c
K2*W7	53,54d
K2*W14	52,63d
K2*W21	51,53e
K2*W28	50,54f
K2*W35	49,84f

Keterangan; Angka yang diikuti dengan huruf yang sama dalam kolom yang sama, tidak berbeda nyata pada taraf uji Duncan = 0.05

Lampiran 24. Uji Duncan Interaksi Perlakuan Konsentrasi Ekstrak (K) dan Waktu Pengamatan (W) Terhadap Kadar Air pada Bakso Ikan Tuna Yang direndam dengan Ekstrak Tanin Selama Penyimpanan Suhu Refrigerator

Perlakuan	Nilai Rataan/Beda
K0*W0	60,88a
K0*W3	58,66ab
K0*W6	57,58b
K0*W9	56,53bc
K0*W12	55,16bc
K0*W15	54,67c
K1*W0	59,78b
K1*W3	57,34bc
K1*W6	55,45bc
K1*W9	53,63c
K1*W12	51,45d
K1*W15	49,21e
K1.5*W0	58,45ab
K1.5*W7	56,36bc
K1.5*W14	54,43c
K1.5*W21	52,56c
K1.5*W28	50,35cd
K1.5*W35	48,54e
K2*W0	56,25bc
K2*W14	54,35c
K2*W21	52,32c
K2*W28	50,62cd
K2*W35	48,39e
K2*W7	46,37e

Keterangan; Angka yang diikuti dengan huruf yang sama dalam kolom yang sama, tidak berbeda nyata pada taraf uji Duncan = 0.05

Lampiran 24. Uji Duncan Interaksi Perlakuan Konsentrasi Ekstrak (K) dan Waktu Pengamatan (W) Terhadap Kadar Protein pada Bakso Ikan Tuna Yang direndam dengan Ekstrak Tanin Selama Penyimpanan Suhu Ruang

Perlakuan	Nilai Rataan/Beda
K0*W0	10,57e
K0*W7	10,56e
K0*W14	10,76e
K0*W21	11,73de
K0*W28	12,36de
K0*W35	11,25de
K1*W0	12,34d
K1*W7	12,57d
K1*W14	13,52d
K1*W21	14,61cd
K1*W28	15,64c
K1*W35	16,08bc
K1.5*W0	13,64cd
K1.5*W7	13,67cd
K1.5*W14	14,41cd
K1.5*W21	15,62c
K1.5*W28	17,15bc
K1.5*W35	17,48bc
K2*W0	14,46c
K2*W7	14,53
K2*W14	15,37c
K2*W21	16,8bc
K2*W28	18,43a
K2*W35	18,58a

Keterangan; Angka yang diikuti dengan huruf yang sama dalam kolom yang sama, tidak berbeda nyata pada taraf uji Duncan = 0.05

Lampiran 25. Uji Duncan Interaksi Perlakuan Konsentrasi Ekstrak (K) dan Waktu Pengamatan (W) Terhadap Kadar Protein Pada Bakso Ikan Tuna Yang direndam Dengan Ekstrak Tanin Selama Penyimpanan Suhu Refrigerator

Perlakuan	Nilai Rataan/Beda
K2*W7	20.76a
K2*W35	20.65a
K2*W28	18.14b
K2*W21	16.45b
K2*W14	15.37bc
K2*W0	14.25c
K1.5*W7	14.37c
K1.5*W35	18.80b
K1.5*W28	17.36b
K1.5*W21	16.55b
K1.5*W14	15.45bc
K1.5*W0	13.56d
K1*W9	15.77bc
K1*W6	14.65c
K1*W3	13.51d
K1*W15	17.56b
K1*W12	16.85b
K1*W0	12.57e
K0*W9	12.57e
K0*W6	11.46f
K0*W3	10.84ef
K0*W15	13.84d
K0*W12	12.74e
K0*W0	10.57ef