

DAFTAR PUSTAKA

- Abuine, R., Rathnayake, A. U., & Byun, H. G. (2019). Biological activity of peptides purified from fish skin hydrolysates. *Fisheries and Aquatic Sciences*, 22(1), 1–14.
- Alhana, Suptijah, P., & Tarman, K. (2015). Ekstraksi dan Karakterisasi Kolagen dari Daging Teripang Gamma. *Jurnal Pengolahan Hasil Perikanan Indonesia*, 18(2), 150-161.
- Anwar, HS., Antasari, M., Hasni, D., Sapriani, N., Rohaya, S., dan Winarti, C. Kombinasi Pati Sukun Termodifikasi Osa (*Octenyl Succinic Anhydride*) dan Lesitin Sebagai Penstabil Emulsi Minyak Dalam Air. *Jurnal Penelitian Pascapanen Pertanian*. 2017;14(3):124-33.
- Arumugam, GKS., Sharma, D., Balakrishnan, RM., dan Ettiyappan, JBP. Extraction, optimization and characterization of collagen from sole fish skin. *Sustainable Chemistry and Pharmacy*. 2018;9:19-26.
- AOAC. 2005. *Official Methods of Analysis*. Association of Official Analytical Chemists: Washington.
- Badan Standardisasi Nasional (BSN). 2013. Ikan Bandeng (*Chanos chanos, Forskal*) Diambil dari: <http://kkp.go.id/> Diakses pada 25 Oktober 2022.
- Badan Standardisasi Nasional (BSN). 2014. Standard Nasional Indonesia SNI 01-8076-2014: Kolagen kasar dari sisik ikan – Syarat mutu dan pengolahan. Jakarta, Indonesia: BSN.
- Baehaki, A., Nopianti, R., & Wati, L. T. (2019). Pengaruh Hidrolisat Kolagen dari Kulit Ikan Patin (*Pangasius pangasius*) terhadap Umur Simpan Pempek Ikan Gabus (*Channa striata*). *Jurnal Agroindustri Halal*, 5(1), 67-74.
- Bintang, M. 2010. Biokomia: Teknik Penelitian. Jakarta: Penerbit Erlangga.
- Berg, J. M., Tymoczko, J. L., dan Stryer L. 2002. Biochemistry 5 ed. New York: W H Freeman.
- Burhanuddin, Iqbal. Ikhtiologi, Ikan dan Segala Aspek Kehidupannya. Depublisher : Yogyakarta. 2014.

- Cardoso, VS., Quelemes, PV., Amorin, A., Primo, FL., Gobo, GG., Tedesco, AC., *et al.*, Collagen Based Silver Nanoparticles for Biological Applications: Synthesis and Characterization. *Journal of Nanobiotechnology*. 2014;12(36):1-9.
- Chuaychan, S., Benjakul, S., dan Kishimura, H. Characteristics of acid – and pepsin- soluble collagens from scale seabass (*Lates calcarifer*). *LWT – Food Science and Technology*. 2015;63(1):71-76.
- Cui, FX., Xue, CH., Li, ZJ., Zhang, YQ., Dong, P., Fu, XY., dan Gao X. Characterization and subunit composition of collagen from the body wall of sea cucumber *Stichopus japonicus*. *The Journal of Food Chemistry*. 2007;100:1120–1125.
- Departemen Kesehatan Republik Indonesia. 1986. Jenis Jenis Ekstraksi. Departemen Kesehatan RI, Jakarta.
- Dhienda, R. A. 2018. Karakterisasi Profil Protein Gelatin Tipe B Tulang Ayam Broiler (*gallus domestica*) Menggunakan Elektroforesis SDS-PAGE. Skripsi UIN Maulana Malik Ibrahim Malang.
- Dirjen Perikanan Budidaya KKP RI. 2012. Panduan Penilaian Sertifikasi Cara Budidaya Ikan yang Baik (CBIB): Jakarta.
- Duong-Ly, K. C., dan Gabelli, S. B. 2014. Salting out of Proteins Using Ammonium Sulfate Precipitation. *Methods in enzimology*. 541: 85-94.
- Ennaas, N., Hammami, R., Gomaa, A., Bédard, F., Biron, É., Subirade, M., dan Fliss, I. Collagencin, An Antibacterial Peptide From Fish Collagen. *Biochemical and Biophysical Research Communications*. 2016;473(2):642-647.
- Ermawati, DE., Martodihardjo, S., dan Sulaiman, TNS. Optimasi Komposisi Emulgator Formula Emulsi Air Dalam Minyak Jus Buah Stroberi (*Fragaria vesca* L.) dengan Metode Simplex Lattice Design. *Journal of Pharmaceutical Science and Clinical Research*. 2017;02:78-89.
- Evan, D. R., Romero, J. K., dan Westoby, M. 2009. Concentration of Protein and removal solutes. In Richard BR & Deutscher MP, Guide to Protein Purification: Methods in Enzimology Vol 463. London, UK: Elsivier.

- Fatchiyah, E., L. Arumingtyas, S., W. dan Rahayu, S. 2011. Biologi Molekular: Prinsip Dasar Analisis. Jakarta: Penerbit Erlangga.
- Fahrul. 2005. Kajian Karakteristik Gelatin dari Kulit Ikan Tuna (*Thunnus alallunga*) dan Karakteristiknya Sebagai Bahan Baku Industri Farmasi. Tesis. Bogor: Institut Pertanian Bogor.
- Gotanco, RGB., dan Menez, MAJ. Population Genetic Structure of Milkfish, *Chanos chanos*, Based on PCR-RFLP Analysis of the Mitochondrial Control Region. *Marine Biology*. 2004;145:789-801.
- Gómez-Guillén, M. C., Turnay, J., Fernández-Díaz, M. D., Ulmo, N., Lizarbe, M. A., and Montero, P. 2002. Structural and physical properties of gelatin extracted from different marine species: A comparative study. *Food Hydrocoll.* 16: 25–34.
- Hadning, I. Formulasi dan Uji Stabilitas Fisik Sediaan Oral Emulsi Virgin Coconut Oil. *Mutiara Medika*. 11(2): 88-100.
- Hartati, I., Kurniasari, L. 2010. Kajian Produksi Kolagen Dari Limbah Sisik Ikan Secara Ekstraksi Enzimatis. *Jurnal Momentum*. 6(1): 33 – 35.
- Hartayanie L, Adriani M, Lindayani. 2014. Karakteristik Emulsi Santan dan Minyak Kedelai yang ditambah Gum Arab dan Sukrosa Ester. *J. Teknol. dan Industri Pangan*, 25 (2).
- Hartono, K. A. 2015. Ekstraksi dan Karakterisasi Kolagen dari Kulit Ikan Tongkol (*Euthynnus affinis*). Skripsi. Bogor: Institut Pertanian Bogor.
- Haq, M., Ho, T. C., Ahmed, R., Getachew, A. T., Cho, Y. J., Park, J. S., & Chun, B. S. (2020). Biofunctional properties of bacterial collagenolytic protease-extracted collagen hydrolysates obtained using catalysts-assisted subcritical water hydrolysis. *Journal of Industrial and Engineering Chemistry*, 81, 332–339.
- Hayes, M. 2011. Marine bioactive compounds: Sources, characterization and applications. Springer Science & Business Media. New York.
- Hemes, B., D. 1998. *Gel Electrophoresis of Proteins*. New York: Oxford University Press.

- Herng Wu, K., dan C. Huey-Jine, 2007, Collagen of Fish Scale and Method of Making, There of Jurnal Ilmiah Internasional, Keelung City. Hartati IL, Kurniasari. 2010 Kajian Produksi Kolagen dari Limbah Sisik Ikan Secara Ekstraksi Enzimatis. Momentum Vol. 6, No. 1, April 2010.
- Hong, H., Fan, H., Chalamaiah, M., & Wu, J. (2019). Preparation of low-molecularweight, collagen hydrolysates (peptides): Current progress, challenges, and future perspectives. Food Chemistry, 301(August), 125222.
- Irawan A. 1995. Pengolahan Hasil Perikanan. Aneka Solo, Solo
- Jafari, H., Lista, A., Siekapen, M. M., Ghaffari-Bohlouli, P., Nie, L., Alimoradi, H., & Shavandi, A. (2020). Fish collagen extraction, characterization, and applications for biomaterials engineering. Polymers, 12(10), 1-37. <http://dx.doi.org/10.3390/polym12102230> PMid:32998331.
- Jamilah B, Umi Hartina MR, Mat Hashim D, Sazili AQ. 2013. Properties of collagen from barramundi (*Lates calcarifer*) skin. International Food Research Journal, 20(2): 835-842.
- Jongjareonrak, A.; Benjakul, S.; Visessanguan, W.; Nagai, T.; Tanaka, M. Isolation and characterization of acid and pepsin-solubilised collagens from the skin of brownstripe red snapper (*Lutjanus vitta*). Food Chem. 2005, 93, 475–484.
- Karim ,A., A. dan Bhat, R. 2009. Fish gelatin: properties, challenges, and prospects as an alternative to mammalian gelatins. The Journal of Food Hydrocolloid 23:563-576.
- Ketnawa S, Martínez-Alvarez O, Benjakul S, Rawdkuen S. 2016. Gelatin hydrolysates from farmed Giant catfish skin using alkaline proteases. Food chemistry, 192: 34-42.
- Kemenkes RI. 2020. Farmakope Indonesia Edisi VI. Jakarta
- Kumar KK, Singh S, Chakraborty S, Das J, Bajaj M, Hemanth V, Nair M, Thota L, Banerjee P. 2019. Recycling fish skin for utilization in food industry as an effective emulsifier and foam stabilizing agent. Turk J Biochem, 44(3)

Lachman, L., A.H. Lieberman and J.L. Kanig. (2008). Teori dan Praktek Farmasi Industri, Edisi III. UI Press, Jakarta.

León-López A, Vargas-Torres A, Morales-Peñaiza A, Martínez-Juárez VM, Zeugolis DI, dan Aguirre-Álvarez G. 2019. Review Hydrolyzed Collagen—Sources and Applications. *Molecules*, 24: 4031

Mahboob S. 2015. Isolation and characterization of collagen from fish waste material-skin, scales and fins of Catla catla and Cirrhinus mrigala. *J. Food Sci. Technol*, 52: 4296–4305

Marzuki A, Pakki E., dan Zulfikar F. 2011. Ekstraksi Dan Penggunaan Gelatin Dari Limbah Tulang Ikan Bandeng (*Chanos Chanos* Forskal) Sebagai Emulgator Dalam Formulasi Sediaan Emulsi. *Majalah Farmasi dan Farmakologi*, 15(2); 63-68.

McClements DJ. Critical review of techniques and methodologies for characterization of emulsion stability. *Critical Reviews in Food Sci. and Nutrition*. 2007;47(7):611–649.

Minarseh, L., Suhaeni., dan Amrullah, S., H. 2021. Analisis Morfologi dan Kadar Protein Ikan Bandeng (*Chanos chanos*) dari Tambak Budidaya Monokultur dan Polikultur (*Gracilaria* sp.) di Kecamatan Bua Kabupaten Luwu. *Jurnal Universitas Islam Negeri Alauddin*, : 987-602-72245-6-8.

Mirhosseini H, Tan CP, Hamid NSA, Yusof S, Chern BH. 2009. Characterization of the influence of main emulsion components on the physicochemical properties of orange beverage emulsion using response surface methodology. *Food Hydrocolloids*, 23(2):271–80.

Nagai, T., Izumi, M., dan Ishii, M., 2004, Fish Scale Collagen: Preparation and Partial Charaterization, *International Journal of Food Science and Technology*, 39 (3): 239-244.

- Nurhidayah, B., Soekendarsi, E., dan Erviani, A., E. 2019. Kandungan Kolagen Sisik Ikan Bandeng *Chanos-Chanos* dan Sisik Ikan Nila *Oreochromis niloticus*. 4(1).
- Noorhorm, A., Ahmad, I., Anal, A., K. : Functionalfoods and dietary supplements. Processing, effect and health benefits. Wiley Blackwell, 2014. 1-527.DOI:10.1002/9781118227800
- Normah, I., & Suryati, N. (2015). Isolation of threadfin bream (*Nemipterus japonicus*) waste collagen using natural acid from calamansi (*Citrofortunella microcarpa*) juice. International Food Research Journal, 22(6), 2294-2301.
- Pamungkas BF, Supriyadi, Murdiati A, Indrati R. 2018. Ekstraksi dan Karakterisasi Kolagen Larut Asam dan Pepsin dari Sisik Haruan (*Channa Striatus*) Kering. JPHPI Volume 21 Nomor 3.
- Paudi R, Sulistijowati R, Mile L. 2020. Rendeman Kolagen Ikan Bandeng (*Chanos chanos*) Segar Hasil Ekstraksi Asam Asetat. Jambura Fish Processing Journal Vol. 2 No.1.
- Putri, O. K., Setyahadi, S., Magister, P., Kefarmasian, I., Pancasila, U., & Sawah, S. (2020). Aktivitas sitotoksik, antioksidan dan adipogenesis hidrolisat kolagen dari ceker ayam. Jurnal Farmasetis, 9(2), 113–130
- Rahmadevi, Hartesi B, Wulandari K. 2020. Formulasi Sediaan Nanoemulsi Dari Minyak Ikan (Oleum Iecoris) Menggunakan Metode Sonikasi. Journal of Healthcare Technology and Medicine, 6 (1).
- Ramdhani F. G., Ariani A. 2016. Pengambilan Kolagen Pada Sisik Ikan Dari Limbah Pabrik Fillet Ikan Menggunakan Metode Ekstraksi Asam. Institut Teknologi Sepuluh November Surabaya.
- Ramdany *et al.*, 2006. Karakteristik Kimia Kerupuk Tulang Ikan Belida (*Chitala Sp.*). Jurnal Ilmu Perikanan Tropis. 19 (2). ISSN 1402-2006.

- Raymundus, J., T., *et al.*, 2020. Pengaruh Perbedaan Konsentrasi Asam Asetat dan Lama waktu Ekstraksi Kolagen dari Kulit Situhuk Hitam (*Makaira indica*). Media Teknologi Hasil Perikanan 8 (2): 44-49.
- Rocha MC, Píccolo MDP, de Abreu WC, Filho AMM, Barcelos MDFP. 2020. Physicochemical properties and use of chia mucilage (*Salvia hispanica L.*) in the reduction of fat in cookies. Braz. J. of Develop., Curitiba, 6(9)
- Romadhon., Darmanto, Y., S., dan Kurniasih, R., A. 2019. Karakteristik Kolagen dari Tulang, Kulit, dan Sisik Ikan Nila. Jurnal Pengolahan Hasil Perikanan Indonesia: 22 (2).
- Riyanto, I. 2006. Analisis Kadar, Daya Cerna dan Karakteristik Protein Daging Ayam Kampung dan Hasil Olahannya. Skripsi. Program Studi Teknologi Hasil Ternak Fakultas Peternakan Institut Pertanian Bogor.
- Rutherford, S. M. (2010). Methodology for determining degree of hydrolysis of proteins in hydrolysates: A Review. Journal of AOAC International, 93(5), 1515–1522.
- Santana RC, Sato ACK, da Cunha RL. 2012. Emulsions stabilized by heat-treated collagen fibers. Food Hydrocolloids, 26(1): 73-81
- Sibilla S, Godfrey M, Brewer S, Budh-Raja A, Genovese L. 2015. An overview of the beneficial effects of hydrolysed collagen as a nutraceutical on skin properties: scientific background and clinical studies. The Open Nutraceuticals Journals, 8: 29-42.
- Syamsuni, H.A. 2006. Ilmu Resep. Jakarta: Buku Kedokteran EGC.
- Thakkar, H., Parmar, M., Nangesh, J., & Patel, D. (2011). Formulation And Characterization Of Lipid-Based Drug Delivery System Of Raloxifene-Microemulsion And Self- Microemulsifying Drug Delivery System. Journal of Pharmacy and Bioallied Sciences, 3(3), 442. <https://doi.org/10.4103/0975-7406.84463>.
- Venkatesan, J., S. Anil, S. Kim & M.S. Shim. 2017. Marine fish protein and peptides for cosmeceuticals: A review. Mar Drugs. 15: 143.

- Veeruraj A, Arumugam M, Balasubramanian T. 2013. Isolation and characterization of thermostable collagen from the marine eel-fish (*Evenchelys macrura*). *Process Biochemistry*, 48(10): 1592-1602.
- Voigt, R. 1995. Buku Pelajaran Teknologi Farmasi, Edisi V. Yogyakarta: Gadjah Mada Universiti Press.
- Wahyu IY. 2018. Optimasi Proses Pretreatment Pada Sisik Ikan Bandeng (*Chanos chanos* frskal) Dengan Response Surface Methodology. Prosiding Seminar Nasional Kelautan dan Perikanan IV.
- Wardani, A. K., dan Nindita, O. L. 2012. Purification and Characterization of Protease from Protease-producing Bacteria Isolated from Tofu Whey. *Jurnal teknologi Pertanian*. 13 (3) : 149-156.
- Westermeier. 2004. *Electrophoresis in Practice: A Guide to Theory and Practice*. New Jersey: John Wiley & Sons Inc.
- Widria, Y., Trilaksani, W., dan Cahyadi, E. R. 2016. Evaluasi dan Pengembangan Sistem Manajemen Rantai Pasok Bandeng Segar (*Chanos chanos*) di Kota Bekasi, Jawa Barat. *Journal IPB*.
- Wijaya, A., Junianto., Subiyanto., & Pratama R. A. (2021). Pengaruh Konsentrasi Kolagen dari Tulang Ikan Nila terhadap Kualitas Krim Kulit Berkala Perikanan Terubuk, 49(3), 1131- 1141.
- Wijayanti, I., Romadhon., dan Rianingsih, L. 2016. Karakteristik Hidrolisat Protein Ikan Bandeng (*Chanos chanos* Forsk) Dengan Konsentrasi Enzim Bromelin Yang Berbeda. *Jurnal Saintek Perikanan*. 11 (2) : 129-133.
- Yunoki, S., T. Suzuki, dan M. Takai, 2003, Stabilization of Low Denaturation Temperature Collagen From Fish by Physical Cross-Linking Methods, *Journal of Bioscience and Bioengineering*, 96 (6): 575-577.
- Zdzieblik, D., Oesser, S., Gollhofer, A., dan König, D. Improvement of Activity-Related Knee Joint Discomfort Following Supplementation of Specific Collagen Peptides. *Applied Physiology. Nutrition and Metabolism*. 2017;42(6):588-595.

- Zhang, Yuhao, Olsen, K., Grossi, A., & Otte, J. (2013). Effect of pretreatment on enzymatic hydrolysis of bovine collagen and formation of ACE-inhibitory peptides. *Food Chemistry*, 141(3), 2343–2354.
- Zhou, P and Joe, M.R. 2005. Effect Of Alkaline and Acid Pretreatments on Alaska Pollock Skin Gelatin Extraction. *Journal of Food Science*, 70(6):392-396.
- Zhou, P., dan Regenstein, J. M., 2006. Determination of Total Protein Content in Gelatin Solutions with the Lowry or Biuret Assay. 71 (8).

Zhu, D., Ortega, C.F., Motamedi, R., Szewciw, L., Vernerey, F., dan Barthelat, F., 2011. Structure and Mechanical Performance of a “modern” Fish scale. *Advanced Engineering Materials*.

