

DAFTAR PUSTAKA

- Adeyeye, E.I., Mojisola A., dan Adeolu. 2014. Amino acids compositions of roasted cocoa, cocoa nibs and cocoa shell. *Int. J. Curr.Res.Chem.Pharma.Sci.* 1(9):01–11.
- ADM Cocoa. 1997. *Sensory Evaluation of Cocoa Products*. De Zaan's Cocoa Manual.
- Afoakwa, E.O., Budu, A.S., Mensah-brown, H., dan Felix, J. 2014. Changes in biochemical and physico-chemical qualities during drying of pulp preconditioned and fermented cocoa (*Theobroma cacao*) beans. *Journal of Nutritional Health and Food Science* 2: 1–8.
- Agustian W., Subandiyono, Sri H. 2013. Pemberian Enzim Papain Untuk Meningkatkan Pemanfaatan Protein Pakan Dan Pertumbuhan Benih Ikan Nila Larasati (*Oreochromis Niloticus* Var.) *Journal of Aquaculture Management and Technology* 2 (1): 1-12.
- Andarwulan, N., Feri K., Dian H. 2011. *Analisis Pangan*. Jakarta: Dian Rakyat.
- Anggraini, A. and Yunianta, Y., 2015. Pengaruh Suhu Dan Lama Hidrolisis Enzim Papain Terhadap Sifat Kimia, Fisik Dan Organoleptik Sari Edamame [In Press Juli 2015]. *Jurnal Pangan dan Agroindustri*, 3(3).
- Apriyanto M., dan Rujiah. 2017. Penurunan total polifenol, etanol, asam laktat, asam asetat, dan asam amino selama fermentasi biji kakao asalan dengan penambahan inokulum. *Jurnal Gizi dan Dietik Indonesia* 5(1): 1-8.
- Aprotosoaie, A., Luca, S. dan Miron, A. 2015. Flavor Chemistry of Cocoa and Cocoa Products—an Overview. *Comprehensive Reviews in Food Science and Food Safety* 15(1).
- Badan Penelitian dan Pengembangan Pertanian. 2013. *Teknologi Pengolahan Primer dan Sekunder Biji Kakao*. Jakarta: Sinar Tani.
- Beg, M. S., Sameer A., Kulsum Jan., Khalid B. 2017. Status, supply chain and processing of cocoa – A review. *Trends in Food Science & Technology*, 66: 108-116.
- Bonvehí, J.S. 2005. Investigation of aromatic compounds in roasted cocoa powder. *European Food Research and Technology*, 221(1): 19–29.
- Castro-Alayo, E. M., Idrogo-Vasquez, G., Siche, R., & Cardenas-Toro, F. P. (2019). Formation of Aromatic Compounds Precursors during Fermentation of Criollo and Forastero cocoa. *Helijon*, 5(1), e01157
- Carpenter, Roland P., David H. Lyon, and Terry A. Hasdell. 2000. *Guidelines for Sensory Analysis in Food Product Development and Quality Control; second edition*. Gaithersburg, Maryland: Aspen Publisher, Inc..

- Chalamaiah M, Jyothirmayi T, Diwan PV, Dinesh KB. 2015. *Antioxidant Activity And Functional Properties Of Enzymatic Protein Hydrolysates From Common Carp (cyprinus carpio) Roe (Egg)*. J Food Sci Technol 52.
- Chairul. 2014. Analisis Faktor-Faktor yang Mempengaruhi Ekspor Biji Kakao Indonesia. *Tesis*. Fakultas Pertanian Universitas Sumatera Utara. Medan.
- David, J., & Tommy P. 2011. Pengaruh Fermentasi Biji Kakao Terhadap Olahan Coklat di Kalimantan Barat. *Biopropal Industri* 2(1): 20-26.
- De Vuyst, L., & S. Weckx. 2016. The cocoa bean fermentation process: from ecosystem analysis to starter culture development. *Journal of Applied Microbiology* 121: 5-17.
- Deng, Y., Butré, C.I. and Wierenga, P.A., 2018. Influence of substrate concentration on the extent of protein enzymatic hydrolysis. *International Dairy Journal* 86.
- Deus V. L., Eliete S. B., Adriana S. F., dan Maria B. A. G. 2021. Understanding amino acids and bioactive amines changes during on-farm cocoa fermentation. *Journal of Food Composition and Analysis* 97.
- D'Souza, R. N., Grimbs, A., Grimbs, S., Behrends, B., Corno, M., Ullrich, M. S., & Kuhnert, N. 2018. Degradation of cocoa proteins into oligopeptides during spontaneous fermentation of cocoa beans. *Food Research International*, 109, 506-516.
- Esbensen, K. Schonkopf, S. Midtgård, T. 1994. *Multivariate Analysis in Practice*. Camo. Trondheim.
- Fang, Y., Rui L., Zhong C., Kexue Z., Fenglin G., dan Yanjun Z. 2020. Chemical and flavor profile changes of cocoa beans (*Theobroma cacao L.*) during primary fermentation. *Food Sci Nutr* 8, 4121-4133.
- Giacometti, J., Jolić, S. M., & Josić, D. 2015. Cocoa Processing and Impact on Composition. *Processing and Impact on Active Components in Food*, 605–612.
- Hadi, S., Nastiti, K. and Sukmana, M.L.Q., 2024. *Analysis Of Protein Levels Using The Magot BsF Uv-Vis Spectrophotometry Method Based On Different Food Media*. JURAGAN-Jurnal Agroteknologi, 2(1), pp.22-27
- Hartuti, S., Nursigit B., Joko N. W. K., Yudi P. 2020. Pengaruh Waktu Pemeraman, Aerasi dan Suhu Fermentor Terhadap Kualitas Biji Kakao. *Agrointek* 14(2): 295-308
- Haryadi, dan Supriyanto. 2012. *Teknologi Cokelat*. Yogyakarta: Gadjah Mada University Press.
- Haslaniza, H., Maskat M. Y., Wan Aida W. M., dan Mamot S. 2010. The effects of enzyme concentration, temperature and incubation time on nitrogen

- content and degree of hydrolysis of protein precipitate from cockle (*Anadara granosa*) meat wash water. *International Food Research Journal* 17: 147-152.
- Hayati, R., Ainun M., dan Farnia R. 2012. Sifat Kimia dan Evaluasi Sensori Bubuk Kopi Arabika. *J. Floratek* 7: 66-75.
- Hustiany, Rini. 2016. Reaksi Maillard: Pembentuk Citarasa dan Warna pada Produk Pangan. Banjarmasin: Lambung Mangkurat University Press.
- Inanda Khoidir, S. 2023. Karakteristik Fisik, Kimia dan Sensoris Biji Kakao Criollo, Forastero dan Trinitario: Review. *Journal of Comprehensive Science (JCS)*: 764–770.
- Jaeger H, Janositz A, Knorr D. The Maillard reaction and its control during food processing. The potential of emerging technologies. *Pathol Biol (Paris)*. 2010 Jun;58(3):207-13
- John, W., Kumari, N., Böttcher , N., Koffi, K., Grimbs, S., Vrancken, G., et al. 2016. *Aseptic Artificial Fermentation of Cocoa Beans Can Be Fashioned to Replicate the Peptide Profile of Commercial Cocoa Bean Fermentations*. *Food Research International* 89(1).
- Juwita, R. ., Tyas, E. ., Sejati, D. A. P. dan Simanjuntak, A. V. S. . 2022. Inovasi Ekstrak Pepaya sebagai Enzim Papain. Jurnal MIPA Dan Pembelajarannya (JMIPAP) 2(4).
- Kementerian Pertanian. 2020. *Outlook Kakao 2020*. Jakarta: Kementerian Pertanian
- Kurniawan, K., Lestari, S. and RJ, S.H., 2012. Hidrolisis Protein Tinta Cumi-Cumi (loligo sp) dengan Enzim Papain. *Jurnal Fishtech*, 1(1), pp.41-54.
- Kusriningrum. 2010. Perancangan Percobaan. Surabaya: Airlangga University Press.
- Meilgaard, M. C., Civille G. V., dan Carr B. T. 1999. *Sensory Evaluation Techniques*. Washington : RC Press.CLL. Ed 3.
- Minah, F. N. M., Muyassaroh, Wasiatul A., dan Mala S. 2021. Pengaruh Variasi Suhu dan Waktu Pengeringan pada Pembuatan Enzim Papain dari Ekstrak Daun Pepaya. *Atmosphere* 2 (2) : 15-21.
- Misnawi, Jinap S., Nazamid S., Jamilah B. 2002. Activation of remaining key enzymes in dried under-fermented cocoa beans and its effect on aroma precursor formation. *Food Chemistry* 78, 407-417.
- Misnawi, Jinap S., Nazamid S., Jamilah B. 2003. Effects of incubation and polyphenol oxidase enrichment on colour, fermentation index, procyandins and astringency of unfermented and partly fermented cocoa beans. *International Journal of Food Science and Technology* 38, 285-295.

- Moreira, I. M. D. V., Miguel, M. G. D. C. P., Duarte, W. F., Dias, D. R., & Schwan, R. F. (2013). Microbial succession and the dynamics of metabolites and sugars during the fermentation of three different cocoa (*Theobroma cacao L.*) hybrids. *Food Research International*, 54(1), 9-17.
- Mulato, S. Widjotomo, S. Misnawi. Suharyanto, E. 2010. *Pengolahan Produk Primer dan Sekunder Kakao*. Jember: Pusat Penelitian Kopi dan Kakao Indonesia.
- Munoz, S.M., Jader R. C., Fabrice E. V., & Sebastian E. P. 2019. An overview of the physical and biochemical transformation of cocoa seeds to beans and to chocolate: flavor formation. *Critical Reviews In Food Science And Nutrition*.
- Nafi, A., Hidayah, N. and Permata, R., 2014. Pembuatan garam gurih jamur merang dengan variasi lama hidrolisis dan lama fermentasi. *Jurnal Ilmiah Inovasi*, 14(2).
- Novinec, M., & Lenarčič, B. 2013. Papain-like peptidases: structure, function, and evolution. *Biomolecular concepts*, 4(3), 287–308.
- Otto, H.H., dan T. Schirmeister. 1997. Cysteine Proteases and Their Inhibitors. *Chem Rev*(97):133-171.
- Poveda, T., Vilcacundo, R., Carpio, C. and Carrillo, W., 2016. Analysis of sesame proteins isolate (*Sesamum indicum L.*) with water and salt treatment. *Asian J. Pharm. Clin. Res* 9(3).
- Prihatini, I. dan Ratna K. D. 2021. Kandungan Enzim Papain pada Pepaya (*Carica papaya L.*) Terhadap Metabolisme Tubuh. *Jurnal Tadris Ipa Indonesia* 1: 449-458.
- Purbaningrum, K., Hidayat, C., Witasari. L.D., and Utami, T. 2023. Flavor Precursors and Volatile Compounds Improvement of Unfermented Cocoa Beans by Hydrolysis Using Bromelain. *Foods* 12(4): 820.
- Rahmawati D., Nuri A., Hanifah N. L. 2015. Identifikasi Atribut Rasa dan Aroma Mayonnaise dengan Metode Quantitative Descriptive Analysis (QDA). *Jurnal Mutu Pangan* 2(2): 80-86.
- Rawel HM, Huschek G, Sagu ST dan Homann T. 2019. *Cocoa Bean Proteins-Characterization, Changes and Modifications due to Ripening and Post-Harvest Processing*. Nutrients 11(2).
- Reed, Stacy. 2010. *Sensory Analysis of Chocolate Liquor*. America: Cargill Incoporate.
- Romero-Cortes, T., Salgado-Cervantes, M.A., García-Alamilla, P., García-Alvarado, M.A., del C Rodríguez-Jimenes, G., Hidalgo-Morales, M. and Robles-Olvera, V., 2013. *Relationship Between Fermentation Index And Other Biochemical Changes Evaluated during The Fermentation of*

- Mexican Cocoa (*Theobroma Cacao*) Beans. Journal of the Science of Food and Agriculture, 93(10), pp.2596-2604.*
- Rosida, Dedin F. 2011. Reaksi Maillard: Mekanisme dan Peran dalam Pangan dan Kesehatan. Yogyakarta: Yayasan Humaniora.
- Sabahannur, St., Netty S., Suraedah A. 2018. *Teknologi Fermentasi Biji Kakao*. Bogor: IPB Press.
- Sari, A. B. T., Fahrurrozi, Tri M., Titiek F. D., Retno U. H., Purwaningsih, Yeyen P. W., Puspita L., Urip P., Ario B. J., dan Endang S. R. 2023. Chemical Composition and Sensory Profiles of Fermented Cocoa Beans Obtained from Various Regions of Indonesia. *International Journal of Food Science*, vol. 2023.
- Setiadevi, S. 2010. *Karakteristik Ekstrak Polifenol Biji Kakao Nonfermented dari Berbagai Macam Metode Ekstraksi*. Universitas Jember.
- Setyaningsih, D., A. Apriyantono, dan M. P. Sari. 2010. Analisis Sensori untuk Industri Pangan dan Agro. Bogor : Institut Pertanian Bogor Press.
- Singh, A., Meena, M., Kumar, D., Dubey, A. K., & Hassan, M. I. (2015). *Structural and Functional Analysis Of Various Globulin Proteins From Soy Seed*. Critical reviews in food science and nutrition, 55(11).
- SNI 2323:2008. Biji Kakao. Jakarta: Badan Standarisasi Nasional.
- SNI 3743:2013. Kakao Bubuk. Jakarta: Badan Standarisasi Nasional.
- Steel, P. G. D. and J. H. Torrie. 1991. Prinsip dan Prosedur Statistika suatu Pendekatan Geometrik. Terjemahan B. Sumantri. Jakarta : PT Gramedia.
- Storer A. C., dan Robert M. 2013. *Handbook of Proteolytic Enzymes (Third Edition)*. Academic Press.
- Sugiharti, Endang. 2016. *Budidaya Kakao*. Bandung: Nuansa Cendekia
- Taha, F.S., Ibrahim, M.A., & El-Zanaty, E.A. (2002). *Optimum Conditions for Enzymatic Degradation of Some Oilseed Proteins*. Grasas Y Aceites, 53.
- Tang, H., Fu, T., Feng, Y., Zhang, S., Wang, C. and Zhang, D., 2019. Effect of Heat Treatment on Solubility, Surface Hydrophobicity and Structure of Rice Bran Albumin and Globulin. *Quality Assurance and Safety of Crops & Foods*, 11(6).
- Tarigan, E. B., dan Tajul I. 2017. Beberapa Komponen Fisikokimia Kakao Fermentasi dan Non Fermentasi. *Jurnal Agroindustri Halal* 3(1):048 – 062.
- Utami, R. R. 2018. Antioksidan Biji Kakao: Pengaruh Fermentasi dan Penyangraian Terhadap Perubahannya. *Jurnal Industri Hasil Perkebunan Vol. 13 No. 2 Desember 2018*: 75-85.

- Wahyudi, T., dan Yusianto. 2009. *Industri Hilir: Dalam Panduan Lengkap Kakao, Menuju Agribisnis dari Hulu hingga Hilir*. Jakarta: Penebar Swadaya.
- Wijanarti, S., Annie M. R., dan Ratih H. 2018. Pengaruh Lama Penyangraian Manual Terhadap Karakteristik Kakao Bubuk. *Jurnal Nasional Teknologi Terapan Vol. 2 No. 2 Juli 2018*: 212 - 222.
- Wijaya, M. dan Wiharto, M. 2017. *Preparation and Characterization of Cacao Waste as Cacao Vinegar and Charcoal*. UNEJ 3-Proceeding 259-261.
- Yazid, E.A. and Nuha, B.U., 2017. Kadar Protein Terlarut Pada Ampas Kedelai Dari Hasil Proses Pembuatan Tempe Dengan Penambahan Ekstrak Kasar Papain (Crude Papain) Dissolved Protein Content in Soybean Dregs From The Process Of Making Tempe With The Addition Of Crude Papain Extract. *Journals of Ners Community 8(1)*.
- Yu Fu, Yuhao Zhang, Olugbenga P. Soladoye & Rotimi E. Aluko. 2019. Maillard reaction products derived from food protein-derived peptides: insights into flavor and bioactivity. *Critical Reviews in Food Science and Nutrition*.
- Yuniar, L., Saadah D. R., R. Ukun M. S. S. 2018. Pengaruh Fermentasi Biji Kakao dengan Menggunakan Kluyveromyces sp., Lactobacillus plantarum, Acetobacter xylinum, Enzim Papain dan Bromelain serta Sistein Terhadap Prekursor Cita Rasa serta Kandungan Nutrisi dan Polifenolnya. *Chimica et Natura Acta Vol. 6 No. 3, Desember 2018*: 127-135
- Yusriah, Y. and Kuswytasari, N.D., 2013. Pengaruh pH dan Suhu Terhadap Aktivitas Protease Penicillium sp. *Jurnal Sains dan Seni ITS, 2(1)*