

DAFTAR PUSTAKA

- Adler, P., Fret, L. J., Berger, A., Bolten, C. J., Hansen, C. E., & Wittmann, C. (2014). The Key to Acetate: Metabolic Fluxes of Acetic Acid Bacteria under Cocoa *Pulp* Fermentation-Simulating Conditions. *Applied and Environmental Microbiology*, 80(15), 4702–4716.
- Afoakwa, E. O. (2016). *Chocolate Science and Technology* (2nd ed.). John Wiley & Sons.
- Afoakwa, E. O., Edem Kongor, J., Takrama, J., Budu, A., Kongor, J. E., Felix Takrama, J., Simpson Budu, A., & Mensah-Brown, H. (2013). Effects of *pulp* preconditioning on total polyphenols, O-diphenols and anthocyanin concentrations during fermentation and drying of Cocoa (*Theobroma cacao*) beans. *Journal of Food Science and Engineering*, 3, 235–245. <https://www.researchgate.net/publication/270272425>
- Afoakwa, E. O., Jennifer, Q., Agnes, S. B., Jemmy, S. T., & Firibu, K. S. (2012). Influence of *pulp*-preconditioning and Fermentation on fermentative quality And appearance of Ghanaian cocoa (*Theobroma Cacao*) beans. *International Food Research Journal*, 19(1), 127–331.
- Alberts, B., Johnson, A., & Lewis, J. (2002). *The Molecular Biology of the Cell* (4th ed.). Garland Science. <http://www.geocities.com/zrnet76/>
- Apriyanto, M., Sutardi, S., Harmayani, E., & Supriyanto, S. (2017). Perbaikan proses fermentasi biji kakao non fermentasi dengan penambahan biakan murni *Saccharomyces cerevisiae*, *Lactobacillus lactis* dan *Acetobacter aceti*. *Agritech*, 36(4), 410. <https://doi.org/10.22146/agritech.16764>
- Ardhana, M. M., & Fleet, G. H. (2003). The microbial ecology of cocoa bean fermentations in Indonesia. *International Journal of Food Microbiology*, 86(1–2), 87–99. [https://doi.org/10.1016/S0168-1605\(03\)00081-3](https://doi.org/10.1016/S0168-1605(03)00081-3)
- Ariani, Y., Bintoro, N., & Karyadi, J. N. W. (2019). Kinetika perubahan kualitas fisik buah mangga selama pengeringan beku dengan perlakuan pendinginan awal dan ketebalan irisan. *AgriTECH*, 39(4), 298.
- Ariyanti, M. (2017). Karakteristik mutu biji kakao (*Theobroma cacao* L) dengan perlakuan waktu fermentasi berdasar SNI 2323-2008. *Jurnal Industri Hasil Perkebunan*, 12(1), 34.

- Aryani, N.L.P.N.A., Yulianti, N.L., & Arda, G. (2018). Karakteristik biji kakao hasil fermentasi kapasitas kecil dengan jenis wadah dan lama fermentasi yang berbeda. *Jurnal BETA*, 6(1), 17 – 24.
- Bart-Plange, A., & Baryeh, E. A. (2002). The physical properties of cocoa beans. *Journal of Food Engineering*, 60(2003), 219–227.
- BSN. (2008). *Standar Nasional Indonesia Biji Kakao, SNI 2323:2008*. Badan Standarisasi Nasional.
- Caligiani, A., Marseglia, A., Prandi, B., Palla, G., & Sforza, S. (2016). Influence of fermentation level and geographical origin on cocoa bean oligopeptide pattern. *Food Chemistry*, 211, 431–439. <https://doi.org/10.1016/j.foodchem.2016.05.072>
- Camu, N., De Winter, T., Addo, S. K., Takrama, J. S., Bernaert, H., & De Vuyst, L. (2008). Fermentation of cocoa beans: Influence of microbial activities and polyphenol concentrations on the flavour of chocolate. *Journal of the Science of Food and Agriculture*, 88(13), 2288–2297. <https://doi.org/10.1002/jsfa.3349>
- Cempaka, L., Aliwarga, L., Purwo, S., & Penia Kresnowati, M. T. A. (2014). Dynamics of cocoa bean *pulp* degradation during cocoa bean fermentation: Effects of yeast *starterculture* addition. *Journal of Mathematical and Fundamental Sciences*, 46(1), 14–25. <https://doi.org/10.5614/j.math.fund.sci.2014.46.1.2>
- Davit, J., Yusuf, R. P., & Ayu Sri Yudari, D. (2013). Pengaruh cara pengolahan kakao fermentasi dan non fermentasi terhadap kualitas, harga jual produk pada unit usaha produktif (UUP) Tunjung Sari, Kabupaten Tabanan. *Jurnal Agribisnis Dan Agrowisata*, 2(4), 191–203. <http://ojs.unud.ac.id/index.php/JAA>
- de Almeida, S. de F. O., Silva, L. R. C., Junior, G. C. A. C., Oliveira, G., da Silva, S. H. M., Vasconcelos, S., & Lopes, A. S. (2019). Diversity of yeasts during fermentation of cocoa from two sites in the Brazilian amazon. *Acta Amazonica*, 49(1), 64–70. <https://doi.org/10.1590/1809-4392201703712>
- De Vuyst, L., & Leroy, F. (2020). Functional role of yeasts, lactic acid bacteria and acetic acid bacteria in cocoa fermentation processes. In *FEMS Microbiology Reviews* (Vol. 44, Issue 4, pp. 432–453). Oxford University Press. <https://doi.org/10.1093/femsre/fuaa014>
- Djaafar, T. F., Monika, D. C., Marwati, T., Triwitono, P., & Rahayu, E. S. (2020). Microbiology, chemical, and sensory characteristics of cocoa powder: the effect of *Lactobacillus plantarum* HL-15 as culture *starter* and fermentation box

variation. *Digital Press Life Sciences*, 2, 00008.
<https://doi.org/10.29037/digitalpress.22332>

Figueroa-Hernandes, C., Mota-Gutierrez, J., Ferrocino, I., Hernandez-Estrada, Z. J., Gonzales-Rioz, O., Cocolin, L., & Suarez-Quiroz, M. L. (2019). The challenges and perspectives of the selection of *startercultures* for fermented cocoa beans. *International Journal Food Microbiol*, 301, 41–50.

Fonsso, D. J., Nzie, W., Ntamack, G. E., & Kenmeugne, B. (2016). Hertz theory application in modeling and analysis of mechanical rupture force of cocoa pod. *International Journal of Mechanical Engineering and Applications*, 4(5), 182.
<https://doi.org/10.11648/j.ijmea.20160405.13>

Hartuti, S., Bintoro, N., Kayadi, J. N. W., & Pranoto, Y. (2018). Fermentasi isothermal biji kakao (*Theobroma cacao*. L) dengan sistem aerasi terkendali. *Agritech*, 38(4), 364–374.

Hatmi, R. U., & Rustijarno, S. (2012). *Teknologi Pengolahan Biji Kakao Menuju SNI Biji Kakao 01-2323-2008*. BPTP Yogyakarta.

ICCO—International Cocoa Organization. (2021). Quartely Bulletin of Cocoa Statistics. In *ICCO Quarterly Bulletin of Cocoa Statistics: Vol. XLVII* (Issue 4, p. Cocoa Year 2020/2021). <https://www.icco.org/statistics/#production>

Indrayati, S., Rahmadani, S. Y., Periadnadi, P., & Nurmiati, N. (2021). Potensi mikrobiota indigenous *pulp* tiga varietas kakao (*Theobroma cacao* L.) sebagai *starter* dalam fermentasi biji kakao. *Biopropal Industri*, 12(1), 19.
<https://doi.org/10.36974/jbi.v12i1.6459>

Jay, J.M.J.Loessner, & D.A.Golden. 2005. *Modern Food Microbiology*. 7th ed. Springer Science, New York.

Kadow, D., Niemenak, N., Rohn, S., & Lieberei, R. (2015). Fermentation-like incubation of cocoa seeds (*Theobroma cacao* L.) - Reconstruction and guidance of the fermentation process. *LWT - Food Science and Technology*, 62(1), 357–361.
<https://doi.org/10.1016/j.lwt.2015.01.015>

Kongor, J. E., Hinneh, M., de Walle, D. Van, Afoakwa, E. O., Boeckx, P., & Dewettinck, K. (2016a). Factors influencing quality variation in cocoa (*Theobroma cacao*) bean flavour profile - A review. *Food Research International*, 82, 44–52. <https://doi.org/10.1016/j.foodres.2016.01.012>

Kongor, J. E., Hinneh, M., de Walle, D. Van, Afoakwa, E. O., Boeckx, P., & Dewettinck, K. (2016). Factors influencing quality variation in cocoa (*Theobroma*

- cacao) bean flavour profile - A review. In *Food Research International* (Vol. 82, pp. 44–52). Elsevier Ltd. <https://doi.org/10.1016/j.foodres.2016.01.012>.
- Kresnowati, M. T. A. P., Suryani, L., & Affifah, M. (2013). Improvement of cocoa beans fermentation by lab starter addition. *Journal of Medical and Bioengineering*, 2(4), 274–278. <https://doi.org/10.12720/jomb.2.4.274-278>
- Kristanto, W., Tamrin, & Erna, M. (2017). Pengaruh penambahan ragi (*Saccaromyces cerevesiae*) dan jumlah lubang kotak pada fermentasi buah kakao (*Theobroma cacao* L) terhadap mutu biji kakao kering. *Jurnal Teknik Pertanian Lampung*, 6(1), 1–10.
- Kristiandi, K., Lusiana, A. S., A'yunin, N. A. Q., Ramdhini, R. N., Marzuki, I., Rezeki, S., Erdiandini, I., Lestari, S. D., Ifadah, R. A., Kushargina, R., Yuniarti, T., & Pasanda, O. S. (2021). *Teknologi Fermentasi* (A. Karim, Ed.). Yayasan Kita Menulis.
- Kustyawati, E. M., & Setyani, S. (2008). Pengaruh penambahan inokulum campuran terhadap perubahan kimia dan mikrobiologi selama fermentasi coklat. *Jurnal Teknologi Industri Dan Hasil Pertanian*, 13(2), 73.
- Misgiyarta, Fauzi, A. M., Syamsu, K., & Munarso, J. (2016). Pemilihan *starter* cair unggul untuk fermentasi biji kakao. *Jurnal Penelitian Pascapanen Pertanian*, 16, 19–24.
- Misnawi, J. (2008). Physico-chemical changes during cocoa fermentation and key enzymes involved Bio-active compound from cocoa beans View project CocoaFruit-Compelte Utilization of Cocoa Fruits for innovative Food Products and Ingredients View project. *Penelitian Kopi Dan Kakao*, 24(1), 47–64. <https://www.researchgate.net/publication/292019683>
- Nasamsir. (2014). Respons pertumbuhan bibit kakao (*Theobroma cacao* L.) terhadap aplikasi pupuk organik cair pada jenis aksesori buah kakao yang berbeda. *Jurnal Ilmiah Universitas Batanghari Jambi*, 14(3), 91–100.
- Ndukwu, M. C., & Udofia, M. (2016). Kinetics of change in colour and some biochemical composition during fermentation of cocoa bean. *Cogent Food and Agriculture*, 2(1). <https://doi.org/10.1080/23311932.2016.1268743>
- Pathare, P. B., Opara, U. L., & Al-Said, F. A. J. (2013). Colour measurement and analysis in fresh and processed foods: a review. In *Food and Bioprocess Technology* (Vol. 6, Issue 1, pp. 36–60). Springer Science and Business Media, LLC. <https://doi.org/10.1007/s11947-012-0867-9>

- Patty, A. (2019). Analisis sifat fisik biji kakao pada berbagai metode fermentasi dan konsentrasi fermipan. *JURNAL HUTAN PULAU-PULAU KECIL*, 3(1), 13–24. <https://doi.org/10.30598/jhppk.2019.3.1.13>
- Qin, X. W., Lai, J. X., Tan, L. H., Hao, C. Y., Li, F. P., He, S. Z., & Song, Y. H. (2017). Characterization of volatile compounds in Criollo, Forastero, and Trinitario cocoa seeds (*Theobroma cacao* L.) in China. *International Journal of Food Properties*, 20(10), 2261–2275. <https://doi.org/10.1080/10942912.2016.1236270>
- Rottiers, H., Tzompa Sosa, D. A., De Winne, A., Ruales, J., De Clippeleer, J., De Leersnyder, I., De Wever, J., Everaert, H., Messens, K., & Dewettinck, K. (2019). Dynamics of volatile compounds and flavor precursors during spontaneous fermentation of fine flavor Trinitario cocoa beans. *European Food Research and Technology*, 245(9), 1917–1937. <https://doi.org/10.1007/s00217-019-03307-y>
- Sachin, A. J., Karthink, N. V. S., & Prashanr, K. (2021). Harvesting, Handling, and Processing of Plantation Crops. In *Postharvest Management of Horticultural Crops* (1st ed.). Jaya Publishing House.
- Sandhya, M. V. S., Yallappa, B. S., Varadaraj, M. C., Puranaik, J., Rao, L. J., Janardhan, P., & Murthy, P. S. (2016). Inoculum of the *starter* consortia and interactive metabolic process in enhancing quality of cocoa bean (*Theobroma cacao*) fermentation. *LWT - Food Science and Technology*, 65, 731–738. <https://doi.org/10.1016/j.lwt.2015.09.002>
- Sandoval, A. J., Barreiro, J. A., De Sousa, A., Valera, D., & Müller, A. J. (2019). Determination of the physical properties of fermented and dried Venezuelan Trinitario cocoa beans (*Theobroma cacao* L.). *Revista Tecnica De La Facultad De Ingenieria Universidad Del Zulia*, 42(2), 47–53. <https://doi.org/10.22209/rt.v42n2a01>
- Santander Muñoz, M., Cortina, J. R., Vaillant, F. E., & Parra, S. E. (2020). 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*, 60, 1593–1613.
- Saunshi, Y. B., Sandhya, M. V. S., Rastogi, N. K., & Murthy, P. S. (2020). *Starter* consortia for on-farm cocoa fermentation and their quality attributes. *Preparative Biochemistry and Biotechnology*, 50(3), 272–280. <https://doi.org/10.1080/10826068.2019.1689508>

- Schwan, R. F., Pereira, G. V. D., & Fleet, G. H. (2014). Microbial activities during cocoa fermentation. In *Cocoa and Coffee Fermentations* (Vol. 4, pp. 130–184). <https://www.researchgate.net/publication/285267847>
- Sigalingging, H. A., Harnesa Putri, S., & Iflah, T. (2020). Perubahan fisik dan kimia biji kakao selama fermentasi. *Jurnal Industri Pertanian*, 2(2), 158–165. <http://>
- Singh, R. P., & Dennis, R. H. (2009). *Intoduction to Food Engineering* (4th ed.). Academic Press.
- Supriyanto. (2009). Pasca panen dan pengolahan biji kakao . In *Bahan Ajar FTP UGM*. UGM Press.
- Tahad, A., & Sanjaya, A. S. (2018). Isoterm freundlich, model kinetika, dan penentuan laju reaksi adsorpsi besi dengan arang aktif dari ampas kopi. *Jurnal Chemurgy*, 1(2), 13.
- Tarigan, E. B., & Iflah, T. (2017). *Beberapa komponen fisikokimia kakao fermentasi dan non fermentasi*. 3(1), 48–061.
- Wahyuni, N. L., Sunarharum, W. B., Muhammad, D. R. A., & Saputro, A. D. (2021). Formation and development of flavour of cocoa (*Theobroma cacao* L.) cultivar Criollo and Forastero: A review. *IOP Conference Series: Earth and Environmental Science*, 733(1). <https://doi.org/10.1088/1755-1315/733/1/012078>
- Widyotomo, S., & Mulato, S. (2008). Teknologi fermentasi dan diversifikasi *pulpa* kakao menjadi produk yang bermutu dan bernilai tambah. *Penelitian Kopi Dan Kakao*, 24(1), 65–82.
- Wood, G. A. R., & Lass, R. A. (2001). *Cocoa* (4th ed.). John Willey and Sons.
- Wulandari, N. W. P., Permana, D. G. M., & Duniaji, A. S. (2019). Pengaruh jenis ragi pada fermentasi kakao terhadap karakteristik cuka kakao. *Jurnal Ilmu Dan Teknologi Pangan*, 8(3), 323–329.
- Yanti, N. A., Jamili, & Susilowati, P. E. (2014). Peningkatan kualitas biji kakao melalui proses fermentasi oleh mikroba lokal asal Sulawesi Tenggara. *Prosiding Semirata MIPA*, 9–11.