

BAB XIII

KESIMPULAN DAN SARAN

13.1 Kesimpulan

Berdasarkan pelaksanaan Praktik Kerja Industri Pengolahan Pangan (PKIPP) di PT Sinar Mas Agro Resources and Technology Tbk. Surabaya, dapat disimpulkan bahwa:

1. PT SMART Tbk. Surabaya telah menerapkan sistem produksi minyak goreng, margarin, dan shortening yang terintegrasi, mulai dari penerimaan bahan baku, proses pemurnian (*refining*), fraksinasi (*fractionation*), formulasi produk, hingga proses pengemasan sesuai dengan standar operasional perusahaan.
2. Pengendalian mutu (*Quality Control*) dilakukan secara menyeluruh pada bahan baku, proses produksi, dan produk akhir melalui pengujian parameter mutu seperti *Free Fatty Acid* (FFA), *Peroxide Value* (PV), *Iodine Value* (IV), *Deterioration of Bleachability Index* (DOBI), warna, kadar air (*moisture*), dan kadar kotoran (*impurities*) sehingga mutu produk tetap terjaga sesuai spesifikasi perusahaan.
3. Pelaksanaan PKIPP memberikan pengalaman dan wawasan mengenai penerapan teknologi pengolahan minyak sawit, sistem pengendalian mutu, manajemen produksi, sanitasi, pengelolaan limbah, serta penerapan sistem keamanan pangan di industri. Kegiatan ini mampu meningkatkan kompetensi teknis, kemampuan analisis, serta pemahaman mahasiswa terhadap penerapan ilmu Teknologi Pangan di dunia industri.

13.2. Saran

1. Penerapan Good Manufacturing Practices (GMP) telah dilaksanakan dengan baik, meliputi pengendalian sanitasi peralatan, sanitasi gedung dan lingkungan, penerapan *personal hygiene*, penggunaan alat pelindung diri (APD), serta pengendalian proses produksi untuk menjamin keamanan dan mutu produk pangan.
2. Pengelolaan limbah di PT SMART Tbk. Surabaya telah dilakukan sesuai karakteristik masing-masing limbah, yaitu limbah cair, limbah padat, dan limbah gas. Limbah B3 seperti

3. blotong serta *bottom ash/fly ash* dikelola melalui kerja sama dengan pihak ketiga yang memiliki izin pengelolaan limbah, sedangkan limbah cair dan emisi gas dikendalikan sesuai prosedur perusahaan untuk meminimalkan dampak terhadap lingkungan.

DAFTAR PUSTAKA

- Ahmad, S., & Schroeder, R. G. (2003). The impact of human resource management practices on operational performance: Recognizing country and industry differences. *Journal of Operations Management*, 21(1), 19–43.
- American Oil Chemists' Society. (2017). Official Methods and Recommended Practices of the AOCS. Champaign: AOCS Press.
- AOCS. (2017). Official Methods and Recommended Practices of the American Oil Chemists' Society.
- AOAC International. (2019). Official Methods of Analysis (21st ed.).
- Aung, M. M., & Chang, Y. S. (2014). Traceability in a food supply chain: Safety and quality perspectives. *Food Control*, 39, 172–184.
- Badan Pengawas Obat dan Makanan Republik Indonesia. (2024). Peraturan Badan Pengawas Obat dan Makanan Nomor 1 Tahun 2024 tentang Pedoman Cara Produksi Pangan Olahan yang Baik (CPPOB). BPOM RI.
- Badan Penyelenggara Jaminan Sosial (BPJS) Ketenagakerjaan. (2024). Program BPJS Ketenagakerjaan.
- Badan Standardisasi Nasional. (2021). SNI 01-2901-2021: Minyak Kelapa Sawit Mentah (*Crude Palm Oil*). Jakarta: BSN.
- Bailey's Industrial Oil and Fat Products (Shahidi, F., Ed.). (2005). John Wiley & Sons.
- Bernevek, T. I., Pavlova, N. L., & Tykhonina, I. I. (2021). Use of modern technologies of bulk cargo transportation by sea transport. *Transport Development*, 4(11), 111–123.
- Chu, B. S., Ghazali, H. M., Lai, O. M., & Che Man, Y. B. (2020). Revising degumming and bleaching processes of palm oil refining for the mitigation of 3-MCPDE and GE contents in refined palm oil. *Food Chemistry*, 307, 125545.
- Codex Alimentarius Commission. (2019). Standard for Named Vegetable Oils (CXS 210-1999, Rev. 2019).
- Codex Alimentarius Commission. (2022). General principles of food hygiene (CXC 1-1969). FAO/WHO.

- Darmaniva, M., Handika, M., & Naja Fiuska, M. (2025). Kajian literatur: Aplikasi margarin dan shortening dalam produk bakery. *Jurnal Agroindustri Pangan*, 4(2), 103–117.
- Deffense, E. (2013). Dry fractionation principles, practices and industrial applications. *OCL - Oilseeds and fats, Crops and Lipids*, 20(6), D604.
- Delery, J. E., & Doty, D. H. (1996). Modes of theorizing in strategic human resource management: Tests of universalistic, contingency, and configurational performance predictions. *Academy of Management Journal*, 39(4), 802–835.
- DeMan, L., DeMan, J. M., & Blackman, B. (1989). Chemical and physical properties of palm oil and palm olein as affected by hydrogenation. *Canadian Institute of Food Science and Technology Journal*, 22(3), 243–247.
- Dessler, G. (2020). Human Resource Management (16th ed.). Pearson.
- Dewi, H., & Yannimar, A. S. (2023). Analisa pengendalian mutu produksi Crude Palm Oil (CPO) menggunakan metode Statistical Quality Control (SQC). *Jurnal Teknologi Pertanian*, 12(1), 20–32.
- FAO. (2013). Edible fats and oils: processing. Rome: Food and Agriculture Organization.
- Gibon, V., De Greyt, W., & Kellens, M. (2012). Palm oil refining. Dalam *Palm Oil: Production, Processing, Characterization, and Uses* (pp. 329–375).
- Gilley, K. M., Greer, C. R., & Rasheed, A. A. (2004). Human resource outsourcing and organizational performance. *Journal of Business Research*, 57(3), 232–240.
- Girsang, D. E. H., & Arvianto, A. (2023). Pengendalian kualitas produk Crude Palm Oil (CPO) dengan metode Six Sigma melalui pendekatan DMAIC (Studi Kasus PTPN II PKS Sawit Seberang). *Industrial Engineering Online Journal*, 12(3).
- Goh, K. M., Choo, Y. M., & Ong, A. S. H. (2022). Recovery and utilization of valuable compounds from palm oil processing by-products: A review. *Journal of Oil Palm Research*, 34(2), 187–205.

- Gunawan, Y. (2025). Biobriket dari Blotong dan Cangkang Kelapa Sawit Dengan Perekat Tepung Tapioka. Politeknik Negeri Cilacap.
- Gunstone, F. D. (Ed.). (2011). *Vegetable Oils in Food Technology: Composition, Properties and Uses* (2nd ed.). Wiley-Blackwell.
- Gupta, V. K., & Suhas. (2009). Application of low-cost adsorbents for dye removal – A review. *Journal of Environmental Management*, 90(8), 2313–2342.
- International Organization for Standardization. (2018). ISO 22000:2018 Food safety management systems—Requirements for any organization in the food chain.
- ISO 662:2016. Animal and Vegetable Fats and Oils—Determination of Moisture and Volatile Matter Content.
- ISO 663:2017. Animal and Vegetable Fats and Oils—Determination of Insoluble Impurities Content.
- ISO 3960:2017. Animal and Vegetable Fats and Oils—Determination of Peroxide Value.
- ISO 6321:2002. Animal and Vegetable Fats and Oils—Determination of Melting Point in Open Capillary Tubes (Slip Point).
- National Agency for Food and Drug Administration and Control. (2023). Current good manufacturing practice guidelines for food and food products (Revised).
- Malaysian Palm Oil Board (MPOB). (2004). MPOB Test Methods.
- Mulyadi. (2016). Akuntansi Biaya. Edisi 5. Yogyakarta: Sekolah Tinggi Ilmu Manajemen YKPN.
- Fellows, P. J. (2017). *Food Processing Technology: Principles and Practice* (4th ed.). Cambridge: Woodhead Publishing.
- Kartika, B. (1990). *Pedoman Uji Inderawi Bahan Pangan*. Yogyakarta: PAU Pangan dan Gizi UGM.
- Kato, S., & Kansha, Y. (2024). Comprehensive review of industrial wastewater treatment techniques. *Environmental Science and Pollution Research*, 31, 51064–51097.
- Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia. (2021). Peraturan Pemerintah Republik Indonesia Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup.

- Ketaren, S. (2012). Pengantar Teknologi Minyak dan Lemak Pangan. UI-Press.
- Kotler, P., Keller, K. L., & Chernev, A. (2022). *Marketing management* (16th ed.). Pearson.
- Kushairi, A., Loh, S. K., Azman, I., Hishamuddin, E., Ong-Abdullah, M., Izuddin, Z. B. M. N., Razmah, G., Sundram, S., & Parveez, G. K. A. (2019). Oil palm economic performance in Malaysia and R&D progress in 2018. *Journal of Oil Palm Research*, 31(2), 165–194.
- Mancini, A., Imperlini, E., Nigro, E., Montagnese, C., Daniele, A., Orrù, S., & Buono, P. (2015). Biological and nutritional properties of palm oil and palmitic acid: Effects on health. *Molecules*, 20(9), 17339–17361.
- Manley, D. (2011). *Manley's Technology of Biscuits, Crackers and Cookies* (4th ed.). Cambridge: Woodhead Publishing.
- Marsh, K., & Bugusu, B. (2007). Food packaging—Roles, materials, and environmental issues. *Journal of Food Science*, 72(3), R39–R55.
- Morgan, N. A., Feng, H., & Whitler, K. A. (2021). Marketing capabilities in international marketing. *Journal of International Marketing*, 29(4), 1–21.
- Noe, R. A. (2020). *Employee Training and Development* (8th ed.). McGraw-Hill Education.
- Rahardja, I. B., Rantawi, A. B., Saputra, H., & Pambudi, D. O. (2023). The Quality Control of Refinery Bleaching Deodorize Palm (RBDP) Olein with Variations of Phosphoric Acid (H_3PO_4) and Bleaching Earth (BE). In *Proceedings of the 4th Borobudur International Symposium on Science and Technology 2022 (BIS-STE 2022)*. Atlantis Press.
- Republik Indonesia. (2023). Undang-Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang-Undang.
- Robertson, G. L. (2016). *Food Packaging: Principles and Practice* (3rd ed.). Boca Raton: CRC Press.

- Rwanda Food and Drugs Authority. (2023). Guidelines for good manufacturing practices for food products.
- Serra J. J., Carmen F., Jessica M., Fransisca S. F., Gloria C. (2024). Effectiveness of natural antioxidants on oxidative stability of margarines. *LWT* 214.
- Siew, W. L., & Tang, T. S. (1989). PORIM Test Methods.
- Sundram, K., Sambanthamurthi, R., & Tan, Y. A. (2022). Palm fruit chemistry and nutrition. *Journal of Oil Palm Research*, 34(1), 1–18.
- Syafira, R. Z., Anwar, S. H., & Rozali, Z. (2022). Pengendalian Mutu Crude Palm Oil (CPO) dengan Metode Control Chart dan Failure Mode and Effect Analysis (FMEA) pada Pabrik Kelapa Sawit PT. XYZ. *Jurnal Teknologi dan Industri Pertanian Indonesia*, 14(2), 81–87.