V.
KESIMPULAN DAN SARAN

5.1 Kesimpulan

Perbedaan proporsi glukosa, fruktosa dan sukrosa pada selai cokelat berpengaruh terhadap kadar air, aktivitas air, daya oles dan sifat organoleptik (aroma, kenampakan, tekstur (*mouthfeel*) dan rasa) selai cokelat berbasis emulsi. Proporsi glukosa, fruktosa dan sukrosa berpengaruh nyata terhadap kadar air, aktivitas air dan sifat organoleptik selai cokelat berbasis emulsi.

Perlakuan terbaik yang dihitung berdasarkan luas daerah terbesar *spider web* uji organopleptik adalah selai cokelat dengan proporsi glukosa:fruktosa:sukrosa 0:100:0 (F2) dan 0:50:50 (F6). Total protein selai cokelat perlakuan terbaik F2 adalah sebesar 5,2519% dan F6 sebesar 5,6928%. Sedangkan kadar lemak F2 adalah sebesar 23,96% dan F6 sebesar 25,3%.

5.2 Saran

Perlakuan kedua dan keenam masih memiliki kelemahan di beberapa parameter. Perlu dilakukan penelitian variasi proporsi glukosa, frutosa dan sukrosa dengan selisih proporsi yang lebih kecil untuk mendapat hasil yang lebih baik di segi daya oles maupun organoleptik.

DAFTAR PUSTAKA

Afoakwa, E. O. (2019). *Cocoa production and processing technology*. CRC Press.

Ali, M. I. K., Mostafa, R. A., & Gawad, A. E. A. (2020). Effects of fat replacing with eggplant puree on characteristics of chocolate spread. *MOJ Food Process Technols*, *8*(3), 132-139.

Arianing, I. F. (2018). *PENGARUH WAKTU PENGGUNAAN MINYAK GORENG KELAPA SAWIT TERHADAP KARAKTERISASI TRIGLISERIDA DAN CRUDE GLYCEROL* (Doctoral dissertation, Universitas Muhammadiyah Sidoarjo).

Association of Official Analytical Chemists. (1984). *Official methods of analysis of the Association of Analytical Chemists*. Association of Official Analytical Chemists..

Association of Official Analytical Chemists. (2005). *Official methods of analysis of the Association of Analytical Chemists*. Association of Official Analytical Chemists.

Badan Pengawas Obat dan Makanan RI. (2013). *Peraturan Kepala Badan Pengawas Obat dan Makanan Republik Indonesia Nomor 36 Tahun 2013 tentang Batas Maksimum Penggunaan Bahan Tambahan Pangan Pengawet.* https://asrot.pom.go.id/img/Peraturan/PerKa%20BPOM%20No.%2036%20Tahun%202013%20tentang%20Batas%20Maksimum%20Pengawet.pdf . (30 April 2021).

Badan Pengawas Obat dan Makanan RI. (2019). *Peraturan Badan Pengawas Obat dan Makanan Nomor 11 Tahun 2019 tentang Bahan Tambahan Pangan*. https://standarpangan.pom.go.id/dokumen/peraturan/2019/PerBPOM_No_11_Tahun_2019_tentang_BTP.pdf.

Badan Standardisasi Nasional. (1992). *Sirup Fruktosa (HFS).* Jakarta: Badan Standardisasi Nasional. https://akses-

sni.bsn.go.id/viewsni/baca/976 (30 April 2021)

Badan Standardisasi Nasional. (1992). SNI 01-2780-1992: Susu evaporasi, Mutu dan cara uji. https://akses-sni.bsn.go.id/viewsni/baca/953 (30 April 2021)

Badan Standardisasi Nasional. (1995). SNI 01-3718-1995: *Lemak reroti.* https://akses-sni.bsn.go.id/viewsni/baca/1574

Badan Standardisasi Nasional. (1998). SNI 01-4457-1998: *Lesitin*. https://akses-sni.bsn.go.id/viewsni/baca/1953 (30 April 2021)

Badan Standardisasi Nasional. (2006). SNI 01-3553-2006: *Air minum dalam kemasan.* https://akses-sni.bsn.go.id/viewsni/baca/3192 (30 April 2021)

Badan Standardisasi Nasional. (2009). *Kakao Bubuk* SNI 3747-2009. Jakarta: Badan Standardisasi Nasional.

Badan Standardisasi Nasional. (2010). *Gula Kristal – Bagian 3 : Putih* SNI 3140.3:2010. Jakarta: Badan Standardisasi Nasional. https://kupdf.net/download/sni-31403-2010-gula-kristal-putihpdf_5af3c506e2b6f5823e084e4f_pdf

Badan Standardisasi Nasional. (2011). *SNI 2971-2011: Susu kental manis.* https://akses-sni.bsn.go.id/viewsni/baca/4607

Badan Standardisasi Nasional. (2013). SNI 2970-2015: *Susu bubuk*. https://akses-sni.bsn.go.id/viewsni/baca/6163 (30 April 2021)

Badan Standardisasi Nasional. (2013). SNI 3747-2013: *Kakao bubuk.* https://akses-sni.bsn.go.id/viewsni/baca/5360

Badan Standardisasi Nasional. (2019). SNI 7709-2019: *Minyak goreng sawit*. https://akses-sni.bsn.go.id/viewsni/baca/7904

Badan Standarisasi Nasional. (1992). *Sirup Glukosa* SNI 01.2978. Jakarta: Badan Standardisasi Nasional.

Baker, C. G., Ranken, M. D., & Kill, R. C. (2012). *Food industries manual*. Springer Science & Business Media.

Benesh, Y. (2002). *Chocolate Spread*. Illinois, PCT/IL01/00913 (WO 02/30212 A2)

Caballero, B., Trugo, L. C., & Finglas, P. M. (2003). *Encyclopedia of food sciences and nutrition*. Academic.

Callebaut Chocolate Academy. (2008). *Dark Chocolate Spread*. https://www.callebaut.com/en-OC/chocolate-recipe/1465/dark-chocolate-spread

Chandan, R. C., Kilara, A., & Shah, N. P. (Eds.). (2009). *Dairy processing and quality assurance*. John Wiley & Sons.

Chen, L., Ao, F., Ge, X., & Shen, W. (2020). Food-grade Pickering emulsions: Preparation, stabilization and applications. *Molecules*, *25*(14), 3202.

Clarke, Z. (2008). Lecithin, (dalam. *xPharm: The Comprehensive Pharmacology Reference*, S.J. Enna dan D.B. Bylund, Eds.), New York: Elsevier Inc., 1–3.

Cruz, A.F. & Alvarez, C.A. (2013). *Cocoa Butter Substitute, French*, WO2013132284A1.

Davis, E. A. (1995). Functionality of sugars: physicochemical interactions in foods. *The American journal of clinical nutrition*, 62(1), 170S-177S.

De Garmo, E.P., Sullivan, W.G. & Bontadelli, J.A. (1993). *Engineering Economy*. New York: Macmillans Publishing Company.

Deril, M., & Novirina, H. (2014). Uji Parameter Air Minum Dalam Kemasan (AMDK) di Kota Surabaya. *Envirotek: Jurnal Ilmiah Teknik Lingkungan*, *6*(1), 1-6.

Dziedzic, S. Z., & Kearsley, M. W. (1984). Glucose syrups: science and technology

Espert, M., Sanz, T., & Salvador, A. (2020). Use of Milk Fat/Cellulose Ether Emulsions in Spreadable Creams and the

Effect of In Vitro Digestion on Texture and Fat Digestibility. *Foods*, *9*(6), 796.

Fahrizal, F., & Fadhil, R. (2014). Kajian Fisiko Kimia dan Daya Terima Organoleptik Selai Nenas yang Menggunakan Pektin dari Limbah Kulit Kakao. *Jurnal Teknologi dan Industri Pertanian Indonesia*, *6*(3).

Food and Drugs Association. (2018). *High Fructose Corn Syrup Questions and Answers*. Amerika Serikat: Food and Drugs Association

Gaby, A.R., (2005). Adverse effects of dietary fructose. *Alternative Medicinereview*, 10(4): 294

Godshall, M. A. (2016). Candies and Sweets: Sugar and chocolate Confectionery (dalam *Encyclopedia of Food And Health*, B. Caballero, P. M. Finglas dan F. Toldra), UK: Elsevier, 621-627.

Hariyadi, P. (2014). Mengenal Minyak Sawit dengan Beberapa Karakteristik Unggulnya.

Hornby, A. S. (2015). Oxford advanced learner's dictionary of "current English". Oxford University Press

Hull, P. (2010). *Glucose syrups: technology and applications*. John Wiley & Sons.

Indrati, R., & Gardjito, M. (2014). Pendidikan konsumsi pangan: Aspek pengolahan dan keamanan.

Jeyarani, T., Banerjee, T., Ravi, R., & Krishna, A. G. (2015). Omega-3 fatty acids enriched chocolate spreads using soybean and coconut oils. *Journal of food science and technology*, 52(2), 1082-1088.

Kang, S., Lee, J. S., Jeong, A., Kim, E., & Park, S. (2014). The effects of using artificial sweeteners and coffee grounds in chocolate filling on quality characteristics and glycemic index. *Journal of Applied Biological Chemistry*, *57*(4), 307-

312.

Kementerian Kesehatan Republik Indonesia. (2018). *Data Komposisi Pangan Indonesia: Susu Kental Manis*. http://panganku.org/id-ID/view (22 Mei 2021).

Kementerian Kesehatan Republik Indonesia. (2018). *Data Komposisi Pangan Indonesia: Susu Skim, Bubuk*. http://panganku.org/id-ID/view (22 Mei 2021).

Kemp, S. E., & IFST PFSG committee. (2008). Application of sensory evaluation in food research.

Kincaid, C.M., P. Begg, S. Kelly-Harris dan J. Batz.. (2004), *Amerika Serikat*, Edible spread composition and packaged product, US7498050B2

Kinyanjui, T., Artz, W.E & Mahungu, S. (2003). EMULSIFIERS | Organic Emulsifiers, (dalam *Encyclopedia of Food Sciences and Nutrition 2nd ed*., B. Caballero, Ed.). Elsevier Inc., 2070-2077.

Manley, D. (2000). Emulsifiers (surfactants) and anti-oxidants, (dalam *Technology of Biscuits, Crackers, and Cookies 3rd ed*., D. Manley, Ed.). Woodhead Publishing, 151-160.

Manzocco, L., Calligaris, S., Camerin, M., Pizzale, L., & Nicoli, M. C. (2014). Prediction of firmness and physical stability of low-fat chocolate spreads. *Journal of Food Engineering*, *126*, 120-125.

Marcus, J. B. (2013). *Culinary nutrition: the science and practice of healthy cooking*. Academic Press.

Marsili, R. (Ed.). (1996). *Techniques for analyzing food aroma* (Vol. 79). CRC Press.

Meng, Z. L. (1990). Studies on the health standard for room temperature in cold regions. *Zhonghua yu Fang yi xue za zhi [Chinese Journal of Preventive Medicine]*, *24*(2), 73-76.

Menon, S., & Nayeem, N. (2013). Vanilla planifolia: a review of a

plant commonly used as flavouring agent. *Int. J. Pharm. Sci. Rev. Res*, *20*(2), 225-228.

Miller, K. B., Hurst, W. J., Payne, M. J., Stuart, D. A., Apgar, J., Sweigart, D. S., & Ou, B. (2008). Impact of alkalization on the antioxidant and flavanol content of commercial cocoa powders. *Journal of agricultural and food chemistry*, *56*(18), 8527-8533.

Naik, B., & Kumar, V. (2014). Cocoa butter and its alternatives: A review. *Journal of Bioresource Engineering and Technology*, *1*, 7-17.

National Center for Biotechnology Information. (2021). Sucrose, *Pubchem CID 5988*

Praja, D. I. (2015). *Zat Aditif Makanan: Manfaat dan Bahayanya*. Garudhawaca..

Rodriguez-Velazques, S. (2020). *Chemistry of Cooking*. LibreTexts.

Rowe, R. C., Sheskey, P., & Quinn, M. (2009). *Handbook of pharmaceutical excipients*. Libros Digitales-Pharmaceutical Press.

Said, A., Nasir, N. A. M., Bakar, C. A. A., & Mohamad, W. A. F. W. (2019). Chocolate spread emulsion: Effects of varying oil types on physico-chemical properties, sensory qualities and storage stability. *Journal of Agrobiotechnology*, *10*(2), 32-42.

Said, A., Nasir, N. A. M., Bakar, C. A. A., & Mohamad, W. A. F. W. (2019). Chocolate spread emulsion: Effects of varying oil types on physico-chemical properties, sensory qualities and storage stability. *Journal of Agrobiotechnology*, 10(2), 32-42.

Santoso, U., Setyaningsih, W., Ningrum, A., & Ardhi, A. (2020). *Analisis Pangan*. UGM PRESS..

Sarungalo, Z. L. (2005). Murtiningrum. Production and Characterization of Glucose Syrup of Papuan Sago Starch. In *Sago Palm Development and Utilization. Proceeding of the*

Eight International Sago Symposium (8ISS), Universitas Negeri Papua, Indonesia.

Setiawan, I. G. M. N. (2019). *KOMPARASI KARAKTERISTIK AIR MINUM ISI ULANG DENGAN AIR MINUM DALAM KEMASAN SELAMA PENYIMPANAN* (Doctoral dissertation, Universitas Pasundan).

Sharma, P., Patel, H & Patel, A. (2016). Evaporated and Sweetened Condensed Milks (dalam *Dairy Processing and Quality Assurance Second Edition*, R. C. Chandan, A. Kilara dan N. P. Shah), UK: Wiley Blackwell, 310-332.

Sikorski, Z. Z., & Kolakowska, A. (Eds.). (2010). *Chemical and functional properties of food lipids*. CRC press.

Sinha, A. K., Sharma, U. K., & Sharma, N. (2008). A comprehensive review on vanilla flavor: extraction, isolation and quantification of vanillin and others constituents. *International journal of food sciences and nutrition*, *59*(4), 299-326.

Smith, D. V., & Margolskee, R. F. (2001). *Making sense of taste. Scientific American*, 284(3), 32-39.

Soraya, N. (2013). *Mengenal Produk Pangan Dari Minyak Sawit*. PT Penerbit IPB Press.

Sørland, G. H., Larsen, P. M., Lundby, F., Rudi, A. P., & Guiheneuf, T. (2004). Determination of total fat and moisture content in meat using low field NMR. *Meat Science*, 66(3), 543-550.

Stamm, M. (2011). *The Pastry Chef's Apprentice: An Insider's Guide to Creating and Baking Sweet Confections and Pastries, Taught by the Masters* (illustrated ed.). Quarry Books. 1592537111, 9781592537112

Sudarmadji, S., Suhardi, & Haryono, B. (1989). *Analisa bahan makanan dan pertanian*. Liberty Yogyakarta bekerja sama dengan Pusat Antar Universitas Pangan dan Gizi Universitas Gadjah Mada.

Sudarmadji, S., Suhardi, & Haryono, B. (2010). *Analisa bahan makanan dan pertanian*. Liberty Yogyakarta bekerja sama dengan Pusat Antar Universitas Pangan dan Gizi Universitas Gadjah Mada.

Syah, D. (2018). *Pengantar Teknologi Pangan*. PT. Penerbit IPB Press.

Szmant, H. H., & Chundury, D. D. (1981). The preparation of 5-hydroxymethylfurfuraldehyde from high fructose corn syrup and other carbohydrates. *Journal of Chemical Technology and Biotechnology*, 31(1), 135-145.

[USFDA] United States Food and Drug Administration. (2018). *Chocolate Spread*. United States Department of Agriculture, United States.

[USFDA] United States Food and Drug Administration. (2020). *Sodium Propiona*te. United States Department of Agriculture, United States.

VICILIA, M. (2019). *THE EFFECT OF SUBSTITUTION RICE FLOUR ON PHYSICAL, CHEMICAL, AND ORGANOLEPTIC OF GLUTEN FREE PIE CRUST MADE FROM MOCAF (MODIFIED CASSAVA FLOUR)* (Doctoral dissertation, UNIKA SOEGIJAPRANATA SEMARANG).

Vijayalakshmi, S., Disalva, X., Srivastava, C., & Arun, A. (2019). Vanilla-natural vs artificial: a review. *Research Journal of Pharmacy and Technology*, *12*(6), 3068-3072.

White, J. S. (2008). Straight talk about high-fructose corn syrup: what it is and what it ain't. *The American journal of clinical nutrition*, 88(6), 1716S-1721S.

Yuwono, S. S., & Susanto, T. (1998). Pengujian fisik pangan. *Fakultas Teknologi Pertanian. Universitas Brawijaya. Malang*.

Yuwono, S. S., & Waziiroh, E. (2019). *Teknologi Pengolahan Tepung Terigu dan Olahannya di Industri*. UB Press.