

BAB V

KESIMPULAN DAN SARAN

5.1. Kesimpulan

Substitusi sukrosa dengan xylitol pada permen *jelly* buah naga memberikan pengaruh nyata ($p < 0,05$) pada sifat fisikokimia yang meliputi kadar air, aktivitas air, tekstur (*hardness*, *springiness*, *cohesiveness*, dan *gumminess*) serta sifat organoleptik yang meliputi kesukaan terhadap rasa, elastisitas, dan daya kunyah namun tidak memberikan pengaruh nyata ($p > 0,05$) pada kesukaan sensasi dingin. Peningkatan konsentrasi xylitol menyebabkan peningkatan terhadap kadar air, *springiness*, kesukaan elastisitas dan daya kunyah, serta penurunan terhadap aktivitas air, *hardness*, dan *gumminess*. Perlakuan terbaik berdasarkan hasil organoleptik adalah permen *jelly* buah naga P6 (sukrosa : xylitol = 27,5% : 12,5%) yang memiliki nilai kadar air (wb) 19,24%, aktivitas air 0,771, *hardness* 23021,082 g, *springiness* 1,067, *cohesiveness* 0,444, *gumminess* 9995,673, skor rasa 4,55 (netral), skor elastisitas 5,09 (agak suka), skor daya kunyah 4,92 (netral), dan skor sensasi dingin 3,43 (agak tidak suka).

5.2. Saran

Uji lanjutan yang perlu dilakukan pada permen *jelly* buah naga adalah pengujian umur simpan dan pengukuran kalori sebelum dipasarkan ke masyarakat luas.

DAFTAR PUSTAKA

- Badan Standarisasi Nasional. 1995. SNI 01-3735-1995: Mutu dan Cara Uji Gelatin. <http://lib.kemenperin.go.id/neo/detail.php?id=225878> (15 September 2019).
- Badan Standarisasi Nasional. 2010. SNI 3140.3-2010: Gula Kristal - Bagian 3: Putih. <http://staffnew.uny.ac.id/upload/132300107/pendidikan/sni-31403-2010-gula-pasir.pdf> (15 September 2019).
- Badan Standarisasi Nasional. 2008. SNI 3547.2-2008: Kembang Gula - Bagian 2: Lunak. <http://staffnew.uny.ac.id/upload/132300107/pendidikan/sni-kembang-gula.pdf> (18 Agustus 2019).
- Bar, A. 1991. Xylitol. In L.O. Nabors and R.C. Gelardi, Eds. *Alternative Sweeteners*. New York: Marcel Dekker, Inc.
- Belitz, H.D. and Grosch, W. 1999. *Food Chemistry*. Berlin: Springer.
- Bellec, F. Le and Vaillant, F. 2011. Pitahaya (pitaya) (*Hylocereus spp.*). In E.M. Yahia, Ed. *Postharvest Biology and Technology of Tropical and Subtropical Fruits: Volume 4: Mangosteen to White Sapote*. Oxford: Woodhead Publishing Limited.
- BeMiller, J.N. and Huber, K.C. 2008. Carbohydrates. In S. Damodaran, K.L. Parkin, and O.R. Fennema, Eds. *Fennema's Food Chemistry Fourth Edition*. Florida: CRC Press.
- Blakemore, W.R. and Harpell, A.R. 2010. Carrageenan. In A. Imeson, Ed. *Food Stabilisers, Thickeners, and Gelling Agents*. Singapore: Wiley-Blackwell.
- Bond, M. and Dunning, N. 2006. Xylitol. In H. Mitchell, Ed. *Sweeteners and Sugar Alternatives in Food Technology*. Oxford: Blackwell Publishing.
- Bourne, M.C. 2002. *Food Texture and Viscosity Concept and Measurement*. 2nd. United States of America: Academic Press, Inc.
- Buckle, K.A., Edward, R.A., Fleet, G.H. and Wootton. 2009. *Ilmu Pangan*. Jakarta: UI-Press.

- Burey, P., Bhandari, B.R., Rutgers, R.P.G., Halley, P.J. and Torley, P.J. 2009. Confectionery Gels: A Review on Formulation, Rheological, and Structural Aspects. *International Journal of Food Properties*, 12:176–210.
- Charoen, R., Savedboworn, W., Phuditcharnchnakun, S. and Khuntaweetap, T. 2015. Development of Antioxidant Gummy Jelly Candy Supplemented with Psidium guajava Leaf Extract. *KMUTNB Int J Appl Sci Technol*, 8(2):145–151.
- Chen, J. and Dickinson, E. 2000. On The Temperature Reversibility of The Viscoelasticity of Acid-Induced Sodium Caseinate Emulsion Gels. *International Dairy Journal*, 10(8):541–549.
- Chrisella, A., Kusumawati, N. dan Suseno, T.I.P. 2015. Pengaruh Perbedaan Penambahan Rumput Laut *Eucheuma cottonii* dan Gelatin dengan Berbagai Konsentrasi terhadap Sifat Fisikokimia dan Organoleptik Permen Jelly Rumput Laut. *Jurnal Teknologi Pangan dan Gizi*, 14(1):38–45.
- Doolittle, A.K. 1965. Mechanism of Plasticization. In P.F. Bruins, Ed. *Plasticizer Technology*. New York: Reinhold Publishing Corp.
- Edwards, W.P. 2000. *The Science of Sugar Confectionery*. Cambridge: RSC Publishing.
- Ergun, R., Lietha, R. and Hartel, R.W. 2010. Moisture and Shelf Life in Sugar Confections. *Critical Reviews in Food Science and Nutrition*, 50:162–192.
- Florence, L. 2018. Pengaruh Penambahan Ekstrak Kayu Secang (*Caesalpinia sappan* L.) terhadap Sifat Fisikokimia dan Organoleptik Permen Jeli Stroberi, *Skripsi S-1*, Fakultas Teknologi Pertanian, Universitas Katolik Widya Mandala Surabaya. [http://repository.wima.ac.id/15900-5/BAB IV.pdf](http://repository.wima.ac.id/15900-5/BAB%20IV.pdf).
- Gontard, N., Guilbert, S. and Cuq, J.L. 1993. Water and Glycerol as Plasticizer Affect Mechanical and Water Vapor Barrier Properties of An Edible Wheat Gluten Film. *Journal of Food Science*, 58:206–211.

- Grembecka, M. 2016. Sugar Alcohols as Sugar Substitutes in Food Industry. In J.M. Mérillon and K.G. Ramawat, Eds. *Sweeteners*. Switzerland: Springer.
- Hartel, R.W., von Elbe, J.H. and Hofberger, R. 2018. *Confectionery Science and Technology*. Switzerland: Springer.
- Hartel, R.W., Ergun, R. and Vogel, S. 2011. Phase/State Transitions of Confectionery Sweeteners: Thermodynamic and Kinetic Aspects. *Comprehensive Reviews in Food Science and Food Safety*, 10:17–32.
- Hootman, R.C. Ed. 1992. *Manual on Descriptive Analysis Testing for Sensory Evaluation*. Philadelphia: American Society for Testing and Materials.
- Hull, P. 2010. *Glucose Syrups Technology and Applications*. Oxford: Wiley-Blackwell.
- Hyvönen, L., Koivistoinen, P. and Voirol, F. 1982. Food Technological Evaluation of Xylitol. *Advances in Food Research*, 28:373–403.
- Jang, S., Kim, H., Hwang, K., Song, D., Kim, Y., Ham, Y., Lim, Y., Jeong, T., Kim, S. and Kim, C. 2015. Effects of Replacing Sucrose with Various Sugar Alcohols on Quality Properties of Semi-dried Jerky. *Korean J. Food Sci.*, 35(5):622–629.
- Kentjono, C.S. 2012. Pengaruh Konsentrasi Gelatin terhadap Sifat Fisikokimia dan Organoleptik Permen Jelly Murbei Hitam (*Morus nigra* L.) Reduced Sugar, *Skripsi S-1*, Fakultas Teknologi Pertanian, Universitas Katolik Widya Mandala Surabaya. <http://repository.wima.ac.id/10876/6/BAb5.pdf>.
- Kristanto, D. 2008. *Buah Naga Pembudidayaan di Pot dan di Kebun*. Surabaya: Penebar Swadaya.
- Lees, R. and Jackson, E.B. 1973. *Sugar Confectionery and Chocolate Manufacture*. London: Springer.
- Liaotrakoon, W. 2013. Characterization of Dragon Fruit (*Hylocereus* spp.) Components with Valorization Potential, *Thesis*, Ghent University. <https://biblio.ugent.be/publication/4093845/file/4336651.pdf>.

- Lin, S., Lee, C., Mau, J., Lin, L. and Chiou, S. 2010. Effect of Erythritol on Quality Characteristics of Reduced-Calorie Danish Cookies. *Journal of Food Quality*, 33:14–26.
- Moser, P., Cornelio, M.L. and Telis, V.R.N. 2013. Influence of The Concentration of Polyols on The Rheological and Spectral Characteristics of Guar Gum. *LWT - Food Science and Technology*, 53(1):29–36.
- Nishinari, K. and Watase, M. 1992. Effects of Sugars and Polyols on The Gel-Sol Transition of Kappa-Carrageenan Gels. *Thermochimica Acta*, 206: 149–162.
- Pangesty, D.R.H. 2018. Identifikasi Pigmen dan Aktivitas Antioksidan Ekstrak Buah Naga, *Tesis*, Institut Pertanian Bogor. <file:///C:/Users/Lenovo/Downloads/2018drh.pdf>.
- Peacock, D. and Peacock, R. 2014. *How to Make Sweets and Treats*. London: Constable & Robinson Ltd.
- Periche, A., Heredia, A., Escriche, I., Andres, A. and Castello, M.L. 2014. Optical, Mechanical, and Sensory Properties of Based-Isomaltulose Gummy Confections. *Food Bioscience*:1–8.
- Pirouzian, H.R., Peighambaroust, S.H. and Azadmard-damirchi, S. 2016. Sucrose-Free Milk Chocolate Sweetened with Different Bulking Agents: Effects on Physicochemical and Sensory Properties. *Biological Forum – An International Journal*, 8(2):340–349.
- Rahman, M.S. and Al-Mahrouqi, A.I. 2009. Instrumental Texture Profile Analysis of Gelatin Gel Extracted from Grouper Skin and Commercial (Bovine and Porcine) Gelatin Gels. *International Journal of Food Sciences and Nutrition*:1–14.
- Sahin, S. and Sumnu, S.G. 2006. *Physical Properties of Foods*. New York: Springer.
- Schwartz, S.J., von Elbe, J.H. and Giusti, M.M. 2008. Colorants. In S. Damodaran, K.L. Parkin, and O.R. Fennema, Eds. *Fennema's Food Chemistry Fourth Edition*. Florida: CRC Press.

- Setyaningsih, D., Apriyantono, A. dan Sari, M.P. 2010. *Analisis Sensori untuk Industri Pangan dan Agro*. Bogor: IPB Press.
- Shaw, N.B., Monahan, F.J., O’Riordan, E.D. and O’Sullivan, M. 2002. Physical Properties of WPI Films Plasticized with Glycerol, Xylitol, or Sorbitol. *Journal of Food Science*, 67(1):164–167.
- Stevens, P. 2010. Gelatine. In A. Imeson, Ed. *Food Stabilisers, Thickeners, and Gelling Agents*. Singapore: Wiley-Blackwell.
- Sudarmadji, S., Haryono, B. dan Suhardi. 2010. *Analisa Bahan Makanan dan Pertanian*. Yogyakarta: Liberty.
- Sudarmadji, S., Haryono, B. dan Suhardi. 1997. *Prosedur Analisa untuk Bahan Makanan dan Pertanian*. Yogyakarta: Liberty.
- Susilo, I., Suseno, T.I.P. dan Kuswardani, I. 2013. Pengaruh Proporsi Sukrosa-Isomalt terhadap Sifat Fisikokimia dan Organoleptik Permen Jelly Anggur Bali (*Alphonso lavallo*). *Jurnal Teknologi Pangan dan Gizi*, 12(1):39–46.
- Szczesniak, A.S., Brandt, M.A. and Friedman, H.H. 1962. Development of Standard Rating Scales for Mechanical Parameters of Texture and Correlation Between The Objective and The Sensory Methods of Texture Evaluation. In *The 22nd Annual Meeting of The Institute of Food Technologist*. Florida: 397–403.
- Thani, M., Kamal, M., Taip, F.S. and Biak, A. 2016. Evaluation on Safety and Sensory Analysis of Xylitol Substituted Dadih. *International Food Research Journal*, 23:203–208.
- Tiefenbacher, K.F. 2017. *The Technology of Wafers and Waffles I: Operational Aspects*. London: Academic Press, Inc.
- Turner, S., Senaratna, T., Touchell, D., Bunn, E., Dixon, K. and Tan, B. 2001. Stereochemical Arrangement of Hydroxyl Groups in Sugar and Polyalcohol Molecules as an Important Factor in Effective Cryopreservation. *Plant Science*, 160:489–497.
- Vaclavik, V.A. and Christian, E.W. 2007. *Essentials of Food Science 3rd Edition*. New York: Springer.

- Varzakas, T., Labropoulos, A. and Anestis, S. Eds. 2012. *Sweeteners Nutritional Aspects, Applications, and Production Technology*. Florida: CRC Press.
- Wee, M.S., Goh, A.T., Stieger, M. and Forde, C.G. 2018. Correlation of Instrumental Texture Properties from Textural Profile Analysis (TPA) with Eating Behaviours and Macronutrient Composition for a Wide Range of Solid Foods. *Food & Function*, 9:5301–5312.
- Wijaya, C.H. 2009. Sensasi Rasa. *Food Review Indonesia*, 4(10):10–15.
- Wijaya, C.H. dan Mulyono, N. 2009. *Bahan Tambahan Pangan: Pewarna*. Bogor: IPB Press.
- Wills, D. 1998. Water Activity and Its Importance in Making Candy. file:///C:/Users/Lenovo/Desktop/SKRIPSWEET/buat_pembahasan/-Wills1998 - Water Activity and its Importance in Making Candy.pdf (19 December 2019).
- Winarno, F.G. 1992. *Kimia Pangan dan Gizi*. Jakarta: Gramedia Pustaka Utama.
- Winkelhausen, E., Jovanovic-malinovska, R., Velickova, E. and Kuzmanova, S. 2007. Sensory and Microbiological Quality of a Baked Product Containing Xylitol as an Alternative Sweetener. *International Journal of Food Properties*, 10:639–649.
- Young, N.W.G. and O’Sullivan, G.R. 2011. The Influence of Ingredients on Product Stability and Shelf Life. In D. Kilcast and P. Subramaniam, Eds. *Food and Beverage Stability and Shelf Life*. Cambridge: Woodhead Publishing Limited.
- Yusof, N., Jaswir, I., Jamal, P. and Saedi, M.S. 2019. Texture Profile Analysis (TPA) of The Jelly Dessert Prepared from Halal Gelatin Extracted Using High Pressure Processing (HPP). *Malaysian Journal of Fundamental and Applied Sciences*, 15(4):604–608.
- Zumbe, A., Lee, A. and Storey, D. 2001. Polyols in Confectionery: The Route to Sugar-Free, Reduced Sugar and Reduced Calorie Confectionery. *British Journal of Nutrition*, 85:31–45.