

## **BAB V**

### **KESIMPULAN DAN SARAN**

#### **5.1. Kesimpulan**

1. Semakin tinggi perbedaan konsentrasi *xanthan gum* pada roti tawar angkak biji durian maka kadar air, volume spesifik, *cohesiveness*, *springiness* roti tawar makin meningkat dan *hardness* yang semakin turun.
2. Semakin tinggi perbedaan konsentrasi *xanthan gum* akan meningkatkan kesukaan panelis terhadap kelembutan dikunyah dan kemudahan ditelan.
3. Perlakuan terbaik dengan menggunakan metode *spider web* berdasarkan hasil uji sensoris adalah perlakuan *xanthan gum* 0,2%.

#### **5.2. Saran**

1. Perlu adanya pengujian lebih lanjut berkaitan dengan pengaruh *xanthan gum* terhadap laju staling roti tawar angkak biji durian bekatul selama penyimpanan seperti *crumb firmness*, kadar air *crumb* dan *moisture loss*.
2. Perlu dilakukan pengujian secara *in vivo* pada roti tawar angkak biji durian bekatul dengan perlakuan konsentrasi *xanthan gum* terbaik (0,2%) terkait dengan potensinya sebagai pangan fungsional.

## **DAFTAR PUSTAKA**

- Alauddin, Md., S.Rahman, J. Islam, H. Shirakawa, M. Komai, and Md.Z.H. Howlader. 2019. Development of Rice Bran Functional Food and Evaluation of Its Healthful Properties, (dalam *Rice Bran and Rice Bran oil*, L. Cheong and X. Xu, Eds.). London: AOCS PRESS.
- America's Test Kitchen (Eds). 2016. *Bread Illustrated: A Step-By-Step Guide to Achieving Bakery-Quality Results at Home*. USA: Penguin Random House Publisher Services.
- Anderson, J.W., P. Baird, R.H. Davis Jr, S. Ferreri, M. Knudtson, A. Koraym, V. Waters and C.L. Williams. 2009. Health Benefits of Dietary Fiber, *Nutrition of Reviews* 67(4): 188-205
- Bonomi, F., P. Ferranti and G. Mamone. 2014. Wheat Flour: Chemistry and Biochemistry, (dalam *Bakery Products Science and Technology* Second Edition, W. Zhou, Y.H. Hui, I.D. Leyn, M.A. Pagani, C.M. Rosell, J.D. Selman and N. Therdthai, Eds.). UK: Wiley Blackwell.
- Bourne, M.C. 2002. *Food Texture and Viscosity: Concept and Measurment* Second Edition. USA: Academic Press.
- Brown, A. 2008. *Understanding Food: Principles and Preparation*, Third Edition. USA: Thomson Wadsworth.
- Brown, J. 1993. Advances in Breadmaking Technology, (dalam *Advances in Baking Technology*, B.S. Kamel and C.E. Stauffer, Eds.). New York: Springer Science + Business Media
- Cauvain, S.P 2012. Breadmaking: An Overview, (dalam *Breadmaking Improving Quality* second edition, S.P. Cauvain, Eds.). Cambridge: Woodhead Publishing Limited.
- Cauvain, S.P. dan L.S. Young. 2008. *Bakery Food Manufacture and Quality: Water Control and Effect* Second Edition. UK: Wiley-Blackwell.
- Chabibah, E.N. 2013. Pengaruh Penambahan Bekatul terhadap Hasil Jadi Roti Tawar (Open Top Bread), *E-Journal Boga* 2(1): 51-57.
- Chan, L.A. 2008. *Panduan Wirausaha Roti Modern*. Jakarta: PT AgroMedia Pustaka.
- Choi, N-E. and J.H. Han. 2015. *How Flavor Works: The Science of Taste and Aroma*. UK: Wiley Blackwell.

- Collado-Fernandez, M. 2003a. Breadmaking Processes, (dalam *Encyclopedia of Food Sciences and Nutrition*, Second Edition, B. Caballero, Eds.). USA: Academic Press
- Collado-Fernandez, M. 2003b. Dough Fermentation, (dalam *Encyclopedia of Food Sciences and Nutrition*, Second Edition, B. Caballero, Eds.). USA: Academic Press
- Damat, D., A. Ta'in, E.A. Saati, R.P. Sudibyo, R. Wijaya, dan D.N. Putri. 2018. *Teknik Pembuatan Roti Manis Fungsional*. Malang: Universitas Muhammadiyah Malang.
- Demirkesen, I., S. Kevlar, O.H. Campanella, G. Sumnu, S. Sahin and M. Okos. 2014. Characterization of Structure of Gluten-Free breads by Using X-ray Mictomography, *Food Hydrocolloids* 36:37-44.
- Dewi, T.M., A. Nurbaiti, P. Suryatmana dan E.T. Sofyan. 2017. Efek Sterilisasi dan Komposisi Mediaproduksi Inokulan Fungi Mikoriza Arbuskula terhadap Kolonisasi Akar, Panjang Akar dan Bobot Kering Akar Sorgum, *Jurnal Agro* 4(1): 24-31.
- Djaeni, M dan A. Prasetyaningrum. 2010. Kelayakan Biji Durian Sebagai Bahan Pangan Alternatif: Aspek Nutrisi dan Tekno Ekonomi, *Jurnal Rekayasa Ilmu Pengetahuan dan Teknologi* 4(11):37-45.
- Dwizella, N., K.N. Berawi dan R. Wahyudo. 2018. Khasiat Bekatul dalam Menurunkan Kadar Lemak Darah pada Pasien Hiperlipidemia, *Majority* 7(2): 1-5.
- Eliasson, A.C. and K. Larsson. 1993. *Cereals in Breadmaking: A Molecular Colloidal Approach*. New York: CRC Press.
- Fares, C and V. Menga. 2014. Chickpea (*Cicer arietinum L*) Fortification of Cereal-Based Foods to Increase Fiber and Phytochemical Content, (dalam *Wheat and Rice in Disease Prevention and Health: Benefit, Risk and Mechanisms of Whole Grains in Health Promotion*, R.R. Watson, V.R. Preedy and S. Zibadi, Eds.). USA: Academic Press.
- Faria, S.A.D.S.C., P.Z. Bassinello and M.D.V.C. Penteado. 2012. Nutritional Composition of Rice Bran Submitted to Different Stabilization Procedures, *Brazilian Journal of Pharmaceutical Sciences* 48(4): 651-657.
- Ferreira, S.C., A.M. Fernandez, M.D.D.C. Bilbao and A.M. Ferandez. 2019. New Functional Ingredients from Agroindustrial By-Products for the Development of Healthy Foods, (dalam *Encyclopedia of Food Security*

- and Sustainability, P. Ferranti, E.M. Berry and J.R. Anderson, Eds.). USA: Elsevier Inc.
- Figoni, P.I. 2011. *How Baking Works: Exploring the Fundamentals of Baking Science*. Hoboken: John Wiley & Sons, Inc.
- Figura, L.O and A.A. Teixeira. 2007. *Food Physics Physical Properties – Measurment and Application*. Jerman: Springer Science+Business Media.
- Gardjito, M. 2013. *Bumbu, Penyedap dan Penyerta Masakan Indonesia*. Jakarta: PT Gramedia Pustaka Utama.
- Gisslen, W. 2009. *Professional Baking* Fifth Edition. Hoboken: John Wiley & Sons, Inc.
- Gul, K., B.Yousuf, A.K. Singh, P. Singh and A.A. Wani. 2015. Rice Bran: Nutritional Values and Its Emerging Potential for Development of Functional Food- A review, *Bioactive Carbohydrates and Dietary Fiber* 6(1): 24-30.
- Harmiatun, Y., Sunarto, dan M. Gultom. 2018. Pemanfaatan Limbah Biji Durian (*Durio zibethinus Murr*) sebagai Bahan Baku Pembuatan Tempe Alternatif Melalui Proses Fermentasi oleh Jamur *Rhizopus oligosporus*, *Jurnal Pro-Life* 5(1): 526-533.
- Hutabarat, A.H. 2018. Simulasi Proses Thawing dan Lama Penyimpanan pada Transportasi Muffin Beku terhadap Kualitas Organoleptik Produk Akhir, *Skripsi S-1*, Fakultas Teknologi Pertanian Institut Pertanian Bogor, Bogor.
- Jou, P.C., B.Y. Ho, Y.W. Hsu and T.M Pan. 2010. The Effect Of *Monascus* Secondary Polyketide Metabolites, Monascin and Ankaflavin, on Adipogenesis and Lipolysis Activity in 3 T3-L1, *Journal of Agricultural and Food Chemistry* 58(24): 12703-12709.
- Jung H., C. Kim, K. Kim and C.S. Shin. 2003. Color Characteristic of *Monascus* Pigment Derived by Fermentation with Various Amino Acids, *Journal of Agricultural and Food Chemistry* 51(5): 1302-1306.
- Jung, E.H., S.R. Kim, I.K. Hwang and T.Y. Ha. 2007. Hypoglycemic Effects of a Phenolic Acid Fraction of Rice Bran and Ferulic Acid in C57BL/KsJ-db/db Mice, *Journal of Agricultural and Food Chemistry* 55(24): 9800-9804.
- Kang, K.S. and D.J. Pettitt. 1993. Xanthan, Gellan, Welan and Rhamsan, (dalam, *Industrial Gums: Polysaccharides and Their Derivates* Third Edition, R.L. Whistler and J.N. Bemiller, Eds.). USA: Academic Press

- Khir, R. dan Z. Pan. 2019. Rice, (dalam *Intergated Processing Technologies for Food and Agricultural By-Products*, Z. Pan, R. Zhang and S. Zicari, Eds.). USA: Academic Press.
- Kohajdova and J. Karovicova. 2009. Application of Hydrocolloids as Baking Improvers: Review, *Chemical Papers* 63(1): 26-38.
- Koeswanto, A. 2019. Pengaruh Penambahan Angkak Biji Durian dan Tepung Bekatul (Rice Bran) terhadap Sifat Fisikokimia dan Organoleptik Roti Tawar, *Skripsi S-1* Fakultas Teknologi Pertanian Universita Katolik Widya Mandala, Surabaya.
- Kouassi-Koffi, J.D., A.P. Ahi, B.M. Faulet, T.J. Gonnety, V. Muresan, E. Mudura and E. Assemend. 2016. Essential Step of Bread Making Process due to Relevant Rheological Parameters of the Raw Material, *International Journal of Pure & Applied Bioscience* 4(2): 58-70.
- Kusharto, C.M. 2006. Serat Makanan dan Peranannya Bagi Kesehatan, *Jurnal Gizi dan Pangan* 1(2): 45-54.
- Laili, Y.E. 2015. Eksperimen Pembuatan Roti Tawar dengan Substitusi Tepung Cassava, *Skripsi S-1*, Fakultas Teknik Universitas Negeri Semarang, Semarang.
- Layton, J.M. and L. Larsen. 2012. *Gluten-Free Baking for Dummies*. Hoboken: John Wiley & Sons, Inc.
- Lee, B.H., W.H. Hsu, T.H. Liao and T.M. Pan. 2011. The *Monascus* Metabolite Monascin Against TNF- $\alpha$ -Induced Insulin Resistance Via Suppressing PPAR- $\gamma$  Phosporylation in C2C12 Myotubes, *Food and Chemical Toxicology* 49, 2609-2617.
- Lestari, D.P. 2010. Karakteristik Fisikokimia Tepung Sorgum Fermentasi dan Aplikasinya sebagai Bahan Substitusi Roti Tawar, *Skripsi S-1*, Fakultas Teknologi Pertanian Institut Pertanian Bogor, Bogor.
- Mandala, I.G. and E. Bayas. 2004. Xanthan Effect on Swelling, Solubility and Viscosity of Wheat Starch Dispersions, *Food Hydrocolloids* 18(2): 191-201.
- Manohar, R.S. 2015. Baking, (dalam *Conventional and Advanced Food Processing Technologies*, S. Bhattacharya, Eds.). UK: Wiley Blackwell.
- Mella, L.M. 2016. Pengukuran Warna selama Pencoklatan Enzimatis Ubi Jalar dengan Kamera Handphone Pintar (HP-P), *Skripsi S-1*, Fakultas Teknologi Pertanian Institut Pertanian Bogor, Bogor.

- Meuser, F. and M. Valentin. 2004. Fermented Dough in Bread Production, (dalam *Handbook of Food and Beverage Fermentation Technology*, Y.H. Hui, L. Meunier-Goddik, A.S. Hansen, J. Josephsen, W.K. Nip, P.S. Stanfield and F. Toldra, Eds.). New York: Marcel Dekker, Inc.
- Mudjajanto, E.S. dan L.N. Yuliati. 2013. *Bisnis Roti*. Jakarta: Penebar Swadaya.
- Murad, H.A., A.G. Abo-Elkhair and H.H. Azzaz. 2019. Production of Xanthan Gum from Nontraditional Substrates with Perspective of the Unique Properties and Wide Industrial Applications, *JSMC Microbiology* 1(6): 1-6.
- Mutdani, H. 2010. *Rahasia Membuat Roti Manis*. Jakarta: Demedia Pustaka.
- Muthoharoh, D.F. dan A. Sutrisno. Pembuatan Roti Tawar Bebas Gluten Berbahan Baku Tepung Garut, Tepung Beras dan Maizena (Konsentrasi Glukomananan dan Waktu Proofing), *Jurnal Pangan dan Agroindustri* 5(2): 34-44.
- Murtadlo, T.A. 2005. *Aneka Roti Tanpa Telur*. Depok: Kawan Pustaka.
- Noviyanti, T., P. Ardiningsih dan W. Rahmalia. 2012. Pengaruh Temperatur terhadap Aktivitas Enzim Protease dari Daun Sansakng (*Pycnarrenha cauliflora Diels*), *Jurnal Kimia Khatulistiwa*. 1(1): 31-34.
- Nugerahani, I., A.M. Sutedja, I. Srianta, R.M. Widharna and Y. Marsono. 2017. In Vivo Evaluation of *Monascus*-Fermented Durian Seed for Antidiabetic and Antihypercholesterol Agent, *Food Research* 1(3): 83-88.
- NPCS Board of Consultants & Engineers. 2011. *Handbook on Fermented Foods and Chemicals*. New Delhi: Asia Pacific Business Press Inc.
- Nussinovitch, A. 1997. Hydrocolloid Applications, Gum Technology in the Food and other Industries. London: Chapman & Hall.
- Pangkalan Ide. 2008. *Health Secret of Kefir*. Jakarta: PT Elex Media Komputindo.
- Pattanagul, P., R. Pinthong, A. Phianmongkhol and N. Leksawasdi. 2007. Review of Angkak Production (*Monascus purpureus*), *Chiang Mai Journal of Science* 34(3): 319-328.
- Petri, D.F.S. 2015. Xanthan Gum: A Versatile Biopolymer for Biomedical and Technological Applications, *Journal of Applied Polymer Science* 132(23): 1-13.

- Prasetyaningrum, A. 2010. Mekanisasi Proses Olahan Biji Durian Menjadi Produk Pangan yang Kompetitif, *Jurnal Rekayasa Ilmu Pengetahuan dan Teknologi*, 4(11): 47-52
- Preston, K.R. and P.C. Williams. 2003. Analysis of Wheat Flours, (dalam *Encyclopedia of Food Sciences and Nutrition*, Second Edition, B. Caballero, Eds.). USA: Academic Press.
- Priatni, S., S. Damayanti, V. Saraswaty, D. Ratnaningrum and M. Singgih. 2014. The Utilization of Solid Substrates on *Monascus* Fermentation for Anticholesterol Agent Production, *Procedia Chemistry* 9, 34-39.
- Puspitadewi, S.R.D., I. Srianta dan N. Kusumawati. 2016. Pola Produksi Pigmen *Monascus* oleh *Monascus sp.* KJR 2 pada Media Biji Durian Varietas Petruk Melalui Fermentasi Padat, *Jurnal Teknologi Pangan dan Gizi* 15(1): 36-42.
- Rahayu, W. P. 1998. *Diktat Penuntun Praktikum Penilaian Organoleptik Fakultas Teknologi Pertanian Bogor*. Bogor: Institut Pertanian Bogor.
- Rosell, C.M. 2011. The Science of Dough and Bread Quality, (dalam *Flour and Breads and Their Fortification in Health and Disease Prevention*, V.R. Preedy, R.R. Watson and V.B. Patel, Eds.), London: Academic Press.
- Sabanis, D. And C. Tzia. 2011. Effect of Hydrocolloids on Selected Properties of Gluten-free Dough and Bread, *Food Science and Technology International* 17(4):
- Santoso, A. 2011. Serat Pangan (*Dietary Fiber*) dan Manfaatnya Bagi Kesehatan, *Magistra* 75(23): 35-40.
- Sciarini, L.S., P.D. Ribotta, A.E. Leon and G.T. Perez. 2010. Effect of Hydrocolloids on Gluten-Free Batter Properties and Bread Quality, *International Journal of Food Science & Technology* 45(11):2306–2312.
- Setyaningsih, D., A. Apriyantono dan M.P. Sari. 2010. *Analisis Sensori untuk Industri Pangan dan Agro*. Bogor: IPB Press.
- Shittu, T.A., R.A. Aminu and E. Abulude. 2009. Functional Effects of Xanthan Gum on Composite Cassava-Wheat Dough and Bread, *Food Hydrocolloids* 23(8):2254–2260.
- Sidhu, J.P.S. and A.S. Bawa. 2002. Dough Characteristics and Baking Studies of Wheat Flour Fortified with Xanthan Gum, *International Journal of Food Properties* 5(1): 1-11.

- Simanullang, I. 2018. Pengaruh Penambahan Tepung Biji Durian terhadap Mutu Fisik dan Mutu Kimia (Kalsium, Protein) Stick Biji Durian, *Skripsi D-4*, Politeknik Kesehatan Medan, Medan.
- Srianta, I., B. Hendrawan, N. Kusumawati and P.J. Blanc. 2012. Study on Durian Seed As a New Substrate for Angkak Production, *International Food Research Journal* 19(3): 941-945.
- Sudarmadji, S., B. Haryono dan Suhardi. 2010. *Prosedur Analisa untuk Bahan Makanan dan Pertanian* Edisi Keempat. Yogyakarta: Liberty.
- Sukkar, S.G., N. Maggi, B.T. Cupillo and C. Ruggiero. 2018. Optimizing Texture Modified Foods for Oro-Pharyngeal Dysphagia: A Difficult but Possible Target?, *Hypothesis and Theory Frontiers in Nutrition* 5(68): 1-10.
- Suparno, R. Efendi dan Rahmayuni. 2016. Pengaruh Perendaman Kapur Sirih dan Garam terhadap Mutu Tepung Biji Durian (*Durio zibethinus Murr*), *JOM FAPERTA* 3(2): 1-14.
- Susila, I.P.P., H. Wijaksana dan N. Suarnadwipa. 2019. Studi Laju Evaporasi Pada Direct Evaporative Cooling Berbahan Pad Jerami Padi dan Tapis Kelapa, *Jurnal Ilmiah Teknik Desain Mekanika* 8(4): 716-720.
- Sutomo, B. 2007. *Sukses Wirausaha Roti Favorit*. Depok: Puspa Swara.
- Tebben, L. and Y. Li, 2018. Effect of Xanthan Gum on Dough Properties and Bread Qualities Made from Whole Wheat Flour, *Cereal Chemistry*. 96(2): 263-272
- Tethool, E.F. dan A.M.P. Dewi. 2017. Pengaruh Konsentrasi Xanthan Gum terhadap Sifat Fisikokimia Tepung Komposit dan Roti yang dihasilkan dari Ubi Jalar dan Sagu, *Prosiding Seminar Nasional Sains dan Teknologi Ke-8*, Semarang, Universitas Wahid Hasyim, Agustus 23, 61-66.
- Tito, I.M. 2014. Isolasi dan Identifikasi Bakteri Kitinolitik yang Terdapat pada Cangkang Lobster Air Tawar (*Cherax quadricarinatus*), *Skripsi S-1*, Fakultas Perikanan dan Kelautan Universitas Airlangga, Surabaya.
- Treuille, E. and U. Ferrigno. 2004. *Ultimate Bread*. New York: DK Publishing. Inc.
- Trisnawati, C.Y., I. Srianta, I. Nugerahani and Y. Marsono. 2019. Incorporating *Monascus*-Fermented Durian Seeds and Rice Bran into Bread: Study on the Physicochemical and Sensory Properties, *Food Research* 3(3): 280-284

- Vallejos, V.B., T.D.M. Crizel and M.D.L.M. Salas-Mellado. 2015. Development of Gluten Free Cakes with the Addition of Methylcellulose and Xanthan Gum, *Semina: Ciências Agrárias* 36(3): 1317-1328, Londrina Brasil.
- Wahyuni, S. Wahyuni dan M. Syukri. 2017. Analisis hasil Organoleptik Hasil Perbaikan Tekstur Roti Manis Wikau Maombo dengan Aplikasi Xanthan Gum, *Jurnal Sains dan Teknologi Pangan* 2(4): 736-748.
- Wulandari, M., dan E. Handarsari. 2010. Pengaruh Penambahan Bekatul terhadap Kadar Protein dan Sifat Organoleptik Biskuit, *Jurnal Pangan dan Gizi* 1(2): 55-62.
- Xian, N. And G. Hu. 2018. Effect of Xanthan Gum and Corn Flour on the Quality of Sponge Cake Using Response Surface Methodology, *Czech Journal of Food Science* 36(4): 349-356.
- Yahyono, S.S. 2006. *Kreasi Roti*. Jakarta: PT. Gramedia Pustaka Utama.
- Yuwono, S.S. dan E. Waziiroh. 2019. *Teknologi Pengolahan Tepung Terigu dan Olahannya Di Industri*. Malang: UB Press.
- Zelada C.R.E., V. Cadavez, F. Monteiro, J.A. Texeira and U.G. Barron. 2018. Combined Effect of Xanthan Gum and Water Content on Physicochemical and Textural Properties of Gluten-Free Batter and Bread, *Food Research International* 111(1): 544-555.