

BAB VI

KESIMPULAN DAN SARAN

6.1. Kesimpulan

1. Metode pengeringan tepung kacang merah yang berbeda memberikan perbedaan ($\alpha = 5\%$) terhadap karakteristik fisikokimia tepung kacang merah yang meliputi kelarutan protein, kadar air, daya serap air, daya serap minyak, kapasitas dan stabilitas buih, stabilitas emulsi, dan warna.
2. Pemakaian tepung kacang merah dengan dua metode pengeringan yang berbeda dalam *cake* beras rendah lemak memberikan pengaruh nyata ($\alpha = 5\%$) terhadap karakteristik fisikokimia *cake* meliputi kadar air, volume spesifik, *cohesiveness*, *gumminess*, dan *chewiness*.
3. Pemakaian tepung kacang merah dengan dua metode pengeringan berbeda dalam *cake* beras rendah lemak memberikan pengaruh nyata ($\alpha = 5\%$) terhadap sifat organoleptik *cake* beras rendah lemak yaitu kesukaan terhadap kelembutan.

6.2. Saran

Metode pengeringan tepung kacang merah yang berbeda memberikan perbedaan terhadap beberapa karakteristik sifat fisikokimia tepung kacang merah dan *cake* beras rendah lemak, serta kesukaan terhadap kelembutan *cake*. Perlu dikaji lebih dalam mengenai kombinasi lama pengukusan kacang merah dan metode pengeringan untuk medapatkan karakteristik fisikokimia tepung kacang merah yang lebih baik sehingga dapat diaplikasikan dalam berbagai produk.

DAFTAR PUSTAKA

- Alimi, B. A., Shitu, T. A., Sanni, L.O., and Arowolo T.A. 2013. Effect of some Hydrocolloids as Adjuncts on The Qualiy of Whole Egg or Egg White Coated Fried Yam Chips. *Journal of Food, Agriculture & Environment.* 11 (1): 19-24
- Anton, A.A. and D. Artfield. 2008. Hidrocolloids in Gluten Free Breads: A Review. *Int. J. Of Food Sci. And Nutr.*, 59(1), 11-23
- Akaerue, B.I. and G.I. Onwuka. 2010. Evaluation of Yield, Protein Content and Functional Properties of Mungbean (*Vigna radiata* (L) Wilczek) Protein Isolates as Affected by Processing. *Pakistan Journal of Nutrition* 9(8) : 728-735.
- Alleoni, A.C.C. 2006. Albumen Proteins and Functional Properties of Gelation and Foaming, *Sci. Agric* 63 (3): 291-298
- Amendola, J. dan N. Rees. 2003. *Understanding Baking: The Art and Science of Baking*, 3rd Edition. USA: John Willey and Sons, Inc.
- AOAC. 1990. *Official Methods of Analysis* 14th Edition. Washington D.C.: Association of Analytical Chemists.
- Baker, C. G. J. 1997. *Industrial Drying of Foods*. London: Chapman.
- Belitz, H. D., W. Grosch, dan P. Schieberle. 2009. *Food Chemistry* 4th revised and extended edition. Germany: Springer-Verlag Berlin Heidelberg.
- Bennion, E. B. dan G. S. T. Bamford. 1997. *The Technology of Cake Making*, 6th Edition. India: Chapman and Hall.
- Booth, M.A., G.L Allan and R. Warner-Smith. 1999. Effects of Grinding, Steam Conditioning and Extrusion of a Practical Diet on Digestibility and Weight Gain of Silver Perch *Bidyanus bidyanus*, *Aquaculture* 182: 287-299
- Bourne, M.C. 2002. *Food Texture and Viscosity: Concept and Measurement* 2nd Edition. New York: Academic Press.

- Buckle, K. A., R. A. Edwards, G. H. Fleet dan M. Wootton. 1987. *Ilmu Pangan*. Terjemahan oleh: Purnomo Hari dan Adiono. Jakarta: UI-Press
- Charley, H. 1982. *Food Science*. Second Edition. New York: John Willey and Sons
- Coultate, T. P. 2009. *Food: The Chemistry of Its Components*. Cambridge: Royal Society of Chemistry.
- Crockett, R. 2009. The Physicochemical of Gluten Free Dough with the Addition of Hydrocolloids and Proteins. *Thesis*. Ohio: The Ohio State University, https://etd.ohiolink.edu/ap/10?0::NO:10:P10_ACCESSION_NUM:osu125182675 (11 November 2014).
- Cunningham, F. E. 1976. Properties of Egg White Foam Drainage. *Poultry Science*. Vol 55: 738-743. <http://albumen.stanford.edu/library/c20/cunningham1976.html> (27 Agustus 2014)
- Direktorat Gizi Departemen Kesehatan Republik Indonesia. 1996. *Daftar Komposisi Bahan Makanan*. Jakarta: Bhratara.
- Duke, J. A. 1981. *Handbook of Legumes of World Economic Importance*. New York: Plenum Press.
- Eisenbrand, G. 2007. *Thermal Processing of Food: Potential Health Benefits and Risks*. Weinheim: WILEY-VCH Verlag GmbH & Co. KGaA
- Eliasson, A. dan M. Gudmundsson. 1996. Starch : *Physicochemical and Functional Aspect*. New York: Marcell Dekker, Inc.
- Ensminger, A. H. 1991. *Food and Nutrition Encyclopedia 2nd edition, Volume I*. London: CRS Press.
- Fennema, O. R. 1996. *Food Chemistry 3rd Edition*. New York: Marcel Dekker, Inc.
- Gisslen, W. 2005. *Professional Baking 4th edition*. USA: John Wiley and Sons, Inc.

- Gomez, M., F. Ronda, P.A. Caballero, C.A. Blanco dan C.M. Rosell. 2007. Functionality of Different Hydrocolloids on the Quality and Shelf-Life of Yellow Layer Cakes, *Food Hydrocolloids*, 21, 167-173.
- Hanneman. 1989. *Bakery Flour Confectionary*. Oxford: Heitienann Professional Publish Ltd.
- Harjadi. 1990. *Pengemulsi, Pemantap Emulsi dan Pengental dalam Bahan Tambahan Makanan (Food Additives)*. Yogyakarta: Pusat Antar Universitas Pangan dan Gizi. Universitas Gadjah Mada
- Harijono, L. S. 2014. Sifat Fungsional Kacang Merah Kukus dengan Variasi Waktu Pengukusan. *Skripsi S-1*. Fakultas Teknologi Pertanian UKWMS, Surabaya.
- Hassan, H.M.M., Afify A.S., Basyiony A.E. and Ghada T.A. 2010. Nutritional and Functional Properties of Defatted Wheat Protein Isolates, *Australian Journal of Basic and Applied Sciences* 4 (2): 348-358.
- Hendarsono. 1984. *Produktifitas dan Sifat Fisikokimia Pati Kacang Merah (Kacang merahga pinnata Merr) di Pengolahan Kedung Halang Kabupaten Bogor*. Bogor : IPB. <http://journal.ipb.ac.id/index.php/jtip/article/view/397/3865> (28 Mei 2015)
- Hercules. 1999. *Physical and Chemical Properties*. Aqualon: Hercules Incorporated.
- Hui, Y. H. 2006. *Bakery Products Science and Technology*. USA: Blackwell Publishing.
- Hui, Y. H. 2006. *Handbook of Food Science, Technology, and Engineering*. Volume 1. USA: CRC Press.
- Joyowiguna, P. 2014. Karakteristik Cake Beras Rendah Lemak dengan Penggunaan Proporsi Gum Xanthan dan Natrium Karboksimetil Selulosa (Na-CMC), *Skripsi S-1*, Fakultas Teknologi Pertanian UKWMS, Surabaya.
- Kartika, B., P. Hastuti, dan W. Supartono. 1988. *Pedoman Uji Inderawi*

- Pangan. Yogyakarta: Universitas Gadjah Mada
- Kaur, M. 2009. *Medical Foods from Natural Sources*. New York : Springer.
- Khattab, R.Y and S.D. Arntfield. 2009. Functional Properties of Raw and Processed Canola Meal. *Food Science and Technology* 42: 1119-1124
- Kinsella, J.E. 1979. Fungsional Properties of Soybean Protein. *Journal. Amer Oil Chem. Soc.* 56:242-257
- Kristanti, P. 2009. Pengaruh Penambahan Na-CMC terhadap Sifat Fisik dan Organoleptik Cake Ketan Hitam. *Skripsi S-1*. Fakultas Teknologi Pertanian UKWMS, Surabaya.
- Lachke, A. 2004. Xanthan – A Versatile Gum. *Ressonance*. October issue: 25-34
- Legowo, A. M. 2007. Peranan Teknologi Pangan dalam Pengembangan Produk Olahan Hasil Ternak di Tengah Kompetisi Global, available at http://eprints.undip.ac.id/315/Anang_Mohamad_Legowo.pdf (20 Maret 2015)
- Luh, B.S. 1991. *Rice: Utilization 2nd Edition*. New York: Van Nostrand Reinhold.
- Lopez, A. C. B., J. G. P. Accacia, dan G. C. Roberto. 2004. Flour Mixture of Rice Flour, Corn, and Cassava Starch in The Production of Gluten Free White Bread. *J. of Braz. Arch. Of Biol. And Technol.* 47 (1): 63-70
- Matz, S.A. 1970. *Cereal Technology*. Connecticut: The AVI Publishing Co.
- McWilliams. 1974. *Food Fundamental 2nd edition*. New York: John Wiley and Sons.
- McWilliams, M. 1997. *Foods Experimental Perspectives, 3rd Edition*. New Jersey: Prentice-Hal Inc.

- Meyer, L. H. 1971. *Food Chemistry*. New York: Reinhold Publishing Co.
- Mizukoshi, M. 1985. Model Studies of Cake Baking VI Effects of Cake Ingredients and Cake Formula on Shear Modulus of Cake. *Cereal Chem.* 62 (4): 247-251.
- Moskowitz, H.R. 1999. *Food Texture: Instrumental and Sensory Measurement*. New York: Marcel Dekker, Inc.
- Muchtadi, T.R. dan Sugiyono. 2013. *Prinsip Proses dan Teknologi Pangan*. Bandung : Alfabeta,cv.
- Natural Resources Conservation Service. 2004. *Vigna radiata* (L.) R. Wilczek: Mung Bean. http://plants.usda.gov/cgi_bin/topics.cgi?earl=plant_profile.cgi&symbol=VIRA4 (25 Agustus 2014).
- Nolan, B. E. 2012. *Rethinking Skim Milk: Low Fat Doesn't Necessarily Mean More Nutritious*. <http://blisstree.com/eat/nutrition/skim-milk-vs-whole-milk-lowfat-not-always-healthier-195/> (25 Agustus 2014)
- Nur, A. 2006. Potensi Batang Kacang Merah sebagai Sumber Pati untuk Instant Starch Noodle. Palu: Universitas Tadulako. <http://id.scribd.com/doc/230257942/Pembuatan-Edible-Film-Dr-Pati-Kacang-Merah> (12 November 2014)
- Oganean, C.F., N. Darie dan M. Oganean. 2006. Fat Replacers-Review, *Journal of Agroalimentary Processes and Technologies*, 12 (2), 433-422.
- Onderi, M.O. 2013. *Effects of Xanthan Gum and Added Protein on the Physical Properties of Gluten-Free Pizza Dough-A Texture Characterization Study Using Instron Model 3342*. University of Wisconsin-Stout, US.
- Pangastuti, H. A., D. R. Affandi dan D. Ishartani. 2013. Karakterisasi Sifat Fisik dan Kimia Tepung Kacang Merah (*Phaseolus vulgaris* L.) dengan Beberapa Perlakuan Pendahuluan, *J. Food Sci.* 2(01): 2302-0733.
- Phillips, G.O. and P.A. Williams. 2000. *Handbook of Hydrocolloids*. New York: CRC Press.

- Poedjiadi, A. 1994. *Biokimia*. Jakarta: UI-Press.
- Pomeranz, Y. and C. E. Meloan. 1991. *Food Analysis: Theory and Practice*. Connecticut: The AVI Publishing Company, Inc.
- Rewthong, O., S. Soponronnarit, C. Taechapairoj, P. Tungtrakul, S. Prachayawarakorn. 2011. Effects of Cooking, Drying, and Pretreatment Methods on Texture and Starch Digestibility of Instant Rice. *Journal of Food Engineering* 103:258-264.
- Rosenthal, A.J. 1999. *Food Texture: Measurement and Perception A Chapman & Hall Food Science Book*. United Kingdom: Springer.
- Sadar, L. N. 2004. Rheological And Textural Characteristics of Copolymerized Hydrocolloidal Solutions Containing Curdlan Gum. *Thesis*. Faculty of the Graduate School of the University of Maryland, College Park. https://www.academia.edu/3472125/RHEOLOGICAL_AND_TEXTURAL_CHARACTERISTICS_OF_COPOLYMERIZED_HYDROCOLLOIDAL_SOLUTIONS_CONTAINING_CURDLAN_GUM (20 Agustus 2014)
- Sai-Ut, S., S. Ketnawa, P. Chaiwut, and S. Rawdkuen. 2010. Biochemical and Functional Properties of Proteins From Red Kidney, Navy and Adzuki Beans. *As. J. Food Ag-Ind.* 2(04): 493-504
- Saputra, R. 2013. Karakteristik Fisikokimia dan Organoleptik Cake Beras dengan Proporsi Margarin dan Kacang Merah Kukus. *Skripsi S-1*, Fakultas Teknologi Pertanian UKWMS, Surabaya.
- Sharma, B. R., L. Naresh., Dhuldhoya, N.C., Merchant, S.U., and Merchant, U.C. 2006. Xanthan Gum - A Boon to Food Industry. *Food Promotion Chronicle*. 1(5):27-30 .
- Stephanie dan R. Jaworski. 2009. *Baking Powder and Baking Soda (Bicarbonate)*. <http://www.joyofbaking.com/bakingsoda.html> (1 Agustus 2014)
- Sudarmadji, S., B. Haryono., Suhardi. 2007. *Prosedur Analisa untuk Bahan Makanan dan Pertanian*. Yogyakarta: Liberty
- Sumnu, S.G. and Sahin. 2008. *Food Engineering Aspects of Baking Sweet Goods*. Boca Raton: CRS Press.

- Sutedja, A.M. dan Ch. Y. Trisnawati. 2012. Peningkatan Sifat Fungsional Protein Kacang-Kacangan sebagai *Fat Replacer* Berbasis Protein. *Laporan Penelitian*. Pusat Penelitian Pangan dan Gizi. Lembaga Penelitian dan Pengabdian Masyarakat. Surabaya: Universitas Katolik Widya Mandala Surabaya.
- Sutedja, A.M. dan Ch. Y. Trisnawati. 2013. Karakteristik Sensoris dan Mikrostruktur *Cake* Beras Rendah Lemak. *Laporan Penelitian*. Pusat Penelitian Pangan dan Gizi. Lembaga Penelitian dan Pengabdian Masyarakat. Surabaya: Universitas Katolik Widya Mandala Surabaya.
- Suyatma, 2009. Diagram Warna Hunter (Kajian Pustaka). *Jurnal Penelitian Ilmiah Teknologi Pertanian*, Institut Pertanian Bogor, Halaman: 8-9.
- Swanson, B. G. 1996. *Low Calorie Fats and Fat Substitutes*. In “Handbook of Fat Replacers,” ed. S. Roller and S. A. Jones, pp. 265-274, CRC Press, Inc., Boca Raton, Fla.
- Tamaki, Y., T. Konishi dan M. Tako. 2011. Gelation and Retrogradation Mechanism of Wheat Amylose, *Materials* (4):1763-1775.
- Trisnawati, C. Y. dan A. M. Sutedja. 2008. Peningkatan Kualitas Rice Cake dengan Penambahan Na-CMC dan *Defatted Rice Bran*, Laporan Penelitian Surabaya: PPPG Research Project 2007, Lembaga Penelitian dan Pengabdian Masyarakat Universitas Kaltolik Widya Mandala Surabaya.
- Tsumura K., Saitoa T., Tsugea K., Ashidaa H., Kugimiya W., and Inouyeb K. 2005. Functional Properties of Soy Protein Hydrolysates Obtained by Selective Proteolysis. *LWT-Food Science and Technology* 38: 255-261.
- USDA. 2010. *Nutrient Value and Weight for Edible Portion*. <http://ndb.nal.usda.gov> (8 Agustus 2014).
- U.S. Dairy Export Council. *Bakery Applications For Milk Powders*. <http://www.usdec.org/files/pdfs/USMP59-70.pdf> (26 Agustus 2014).

- Vaclavik, V. A. dan E. W. Christian. 2008. *Essentials of Food Science.* 3rd edition. New York: Springer Science + Business Media, LLC.
- Wang, R. 2013. Karakteristik Sifat Fungsional Kacang Merah Rebus dengan Variasi Waktu Perebusan. *Skripsi.* Surabaya: Fakultas Teknologi Pertanian Universitas Katolik Widya Mandala Surabaya.
- Widyastika, D.M. 2008. Deteksi Bakteri Gram Negatif (*Salmonella* sp, *Escherichia coli* dan Koliform) pada Susu Bubuk Skim Impor. *Skripsi S-1,* Fakultas Kedokteran Hewan IPB, Bogor. <https://ml.scribd.com/doc/100665861/deteksi-baky> (10 November 2014).
- Wijaya, D. A. 2014. Pengaruh Lama Pengukusan Kacang Merah Terhadap Karakteristik Sosis Ayam Rendah Lemak Yang Menggunakan Kacang Merah Sebagai Fat Replacer. *Skripsi.* Jurusan Teknologi Pangan dan Gizi, Universitas Katolik Widya Mandala Surabaya, Surabaya.
- Winarno, F. G. 1993. *Pangan Gizi, Teknologi dan Konsumen.* Jakarta: PT. Gramedia Pustaka Utama.
- Winarno, F. G. 2002. *Kimia Pangan.* Jakarta: PT. Gramedia Pustaka Utama
- Winarno, F. G. 2004. *Kimia Pangan.* Jakarta: PT. Gramedia Pustaka Utama
- Xue, J. and N. Michael. 2007. Effects of Methylcellulose, Xanthan gGum and Carboxymethylcellulose on Thermal Properties of Batter Systems Formulated with Different Flour Combinations, *Food Hyrocolloids* 23: 286-295.
- Yada. 2004. *Proteins in Food Processing.* Abington: Woodhead Publishing Limited.
- Yazid, E dan Nursanti. 2006. Penuntun Praktikum Biokimia. Yogyakarta: Penerbit Andi.
- Zayas, J. F. 1997. *Functional of Proteins in Food.* Berlin Springer-Verlag.