BAB VI
KESIMPULAN DAN SARAN

6.1. Kesimpulan

1. Pengurangan telur yang semakin tinggi menyebabkan kadar air, volume spesifik, *springiness*, *cohesiveness*, *lightness*, *redness*, *yellowness*, dan *chroma cake* beras rendah lemak semakin menurun, sedangkan *hardness* dan *hue cake* beras rendah lemak semakin meningkat.
2. Pengurangan telur yang semakin tinggi menyebabkan kesukaan terhadap keseragaman pori, warna, kemudahan digigit, kelembutan (kemudahan dikunyah), rasa, dan kemudahan ditelan *(moistness*) *cake* beras rendah lemak semakin menurun.
3. *Cake* beras rendah lemak dengan pengurangan telur 40% merupakan perlakuan yang masih dapat diterima panelis. *Cake* beras rendah lemak tersebut memiliki kadar air sebesar 43,51%, volume spesifik sebesar 4,03 cm^3/g, *hardness* sebesar 5453,72 g, *springiness* sebesar 0,717 g, dan *cohesiveness* sebesar 0,668 g, serta kesukaan terhadap keseragaman pori 3,91 (agak tidak suka), warna 4,22 (netral), kemudahan digigit 4,89 (netral), kelembutan (kemudahan dikunyah) 4,51 (netral), rasa 4,71 (netral), dan kemudahan ditelan *(moistness*) 4,30 (netral).

6.2. Saran

Melalui penelitian ini telah diperoleh bahwa pengurangan telur hingga 40% dengan penggunaan gum xanthan 0,4% pada *cake* beras rendah lemak masih dapat diterima. Perlu dilakukan penelitian lebih lanjut agar didapatkan pengurangan telur yang lebih besar dari 40% dengan menggunakan konsentrasi gum xanthan yang tepat pada *cake* beras rendah lemak sehingga didapatkan sifat fisikokimia dan organoleptik yang lebih baik yang masih dapat diterima panelis.

DAFTAR PUSTAKA

Abdel-Aal, E. M., H. Akhtar, K. Zaheer, and R. Ali. 2013. Dietary Sources of Lutein and Zeaxanthin Carotenoids and Their Role in Eye Health, *Nutrients* (5): 1169-1185.

Akaerue, B.I. dan G.I. Onwuka. 2010. Evaluation of Yield, Protein Content and Functional Properties of Mungbean (Vigna raditia (L) Wilczek) Protein Isolates as Affected by Processing. *Pakistan Journal of Nutrition* 9(8) : 728-735.

Al-Muhtaseb, A.H., W. McMinn, E. Megahey, G. Neill, R. Magee, and U. Rashid. 2013. Textural Characteristics of Microwave-Baked and Convective-Baked Madeira Cake, *J. Food Process Technol.*, 4(2): 1-8.

Amendola, J. And N. Rees. 2003. *Understanding Baking: The Art and Science of Baking, 3rd Edition*. USA: John Wiley and Sons, Inc.

Ansari, S., N. Maftoon-Azad, A. Farahnaky, E. Hosseini, and F. Badii. 2014. Effect of Moisture Content on Textural Attributes of Dried Figs, *Int. Agrophys.*, 2014(28): 403-412.

Anton, A. A. dan D. Artfield. 2008. Hidrocolloids in Gluten Free Breads, *J. Food Sci.* 59(1): 11-23.

Ashwini, A., R. Jyotsba, and D, Indrani. 2009. Effect of Hidrocolloids and Emulsifier on the Rheological, Microstructural, and Quality of Eggless Cake. *Food Hydrocolloids*. 23: 700-707.

AOAC. 1990. *Official Methods of Analysis 14th Edition*. Washington D.C.: Association of Analytical Chemists.

Barham, P. 2001. *The Science of Cooking*. Jerman: Springer.

Batt, C. A. and M. A. Tortorello. 2014. *Encyclopedia of Food Microbiology Second Edition*. London: Elsevier.

Belitz, H. D., W. Grosch, and P. Schieberle. 2009. *Food Chemistry 4th Revised and Extended Edition*. Berlin: Springer.

Bennion, E. B. and G. S. T. Bamford. 1997. *The Technology of Cake Making, 6th Edition*. India: Chapman and Hall.

Blais, C. 2011. *Food Chemistry: Operation Meringue*. http://www.ricardocuisine.com/articles/food-chemistry/72-operation-*meringue* (20 Juli 2015).

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 (2000): 287-299.

Brown, A. 2014. *Understanding Food Principles and Preparation Fifth Edition*. Stamford: Cengage Learning.

Buckle, K.A., R.A. Edwards, G.H. Fleet and M. Wooton. 1987. *Ilmu Pangan* (Poernomo, H. dan Adiono, Penerjemah). Jakarta: Universitas Indonesia.

Cauvain, S and L. Young. 2006. *Baked Products Science, Technology andPractice*. UK: Blackwell Publishing.

Charley, H. 1982. *Food Science*. Second Edition. New York: John Willey and Sons.

Chevallier, S., Colonna, P., Della Valle, G. and Lourdin, D. 2000. Contribution of Major Ingredients During Baking of Dough Systems. *Jornal of Cereal Science* 31: 241-252.

Cho, S. S., L. Prosky, and M. Dreher (Eds). 1999. *Complex Carbohydrates in Foods*. New York: Marcell Decker, Inc.

Dinas Peternakan Provinsi Jawa Timur. 2014. *Info Harga di Jawa Timur*. http://disnak.jatimprov.go.id/web/layananpublik/infoharga (13 September 2015).

Direktorat Gizi Departemen Kesehatan Republik Indonesia. 1996. *Daftar Komposisi Bahan Makanan*. Jakarta: Bharata.

Duke, J. A. 1981. *Handbook of Legumes of World Economic Importance*. New York: Plenum Press.

Eduardo, M., U. Svanberg and L. Ahrne. 2014. Effect of Hydrocolloids and Emulsifiers on Baking Quality of Composite Cassava-Maize-Wheat Breads, *International Journal of Food Science*. 2014: 1-9.

Edwards, W. P. 2007. *The Science of Bakery Products*. Cambridge: The Royal Society of Chemistry

Eisenbrand, G. 2007. *Thermal Processing of Food: Potential Health Benefits and Risks.* Weinheim: WILEY-VCH Verlag GmbH & Co. KGaA.

Figoni, P. 2008. *How Baking Works: Exploring The Fundamentals of Baking Science*. New Jersey: John Wiley & Sons, Inc.

Food and Drug Administration. 2013. *Guidance for Industry: A Food Labeling Guide (9. Appendix A: Definitions of Nutrient Content Claims).* www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm064911.htm (10 Agustus 2015).

Gimeno, E. Moraru, C. I. and Kokini, L. 2004. Effect of Xanthan Gum and CMC on the Structure and Texture of Corn Fluor Pellets Expanded by Microwave Heating. *Journal of Cereal Chemistry* 81 (1):100-107.

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 *Cake*s, *Food Hydrocolloids*, 21, 167-173.

Hanneman. 1989. *Bakery Flour Confectionary*. Oxford: Heitienann Professional Publish Ltd.

Hosanasea, E. 2013. Peran Penambahan Susu Skim Terhadap Karakteristik *Cake* Beras Rendah Lemak, *Skripsi S-1*, Fakultas Teknologi Pertanian UKWMS, Surabaya.

Hui, Y.H., (Ed). 2006. *Bakery Products: Science Technology*. Iowa: Blackwell Publishing.

HunterLab. 2008. Hunter L, a, b Color Scale. www.hunterlab.se/wp-content/uploads/2012/11/Hunter-L-a-b.pdf (12 Februari 2016).

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.

Kohajdova, Z., J. Karovicova and S. Schmidt. 2009. Significance of Emulsifiers and Hydrocolloids in Bakery Industry, *Acta Chimica Slovaca* 2 (1):46-61.

Kohrs, D., T. J. Herald, F. M. Aramouni, and M. Abughoush. 2010. Evaluation of Egg Replacers in a Yellow Cake System, *Emir. J. Food Agric.*, 22 (5): 340-352.

Kristanti, P. 2009. Pengaruh Penambahan Na-CMC terhadap Sifat Fisik dan Organoleptik Cake Ketan Hitam. *Skripsi S-1*. Fakultas Teknologi Pertanian UKWMS, Surabaya.

Kurniasari, D. 2012. Penggunaan Kacang Hijau Kukus sebagai *Fat Replacer* terhadap Sifat Fisikokimia dan Organoleptik *Cake* Beras. *Skripsi S-1*. Surabaya: Fakultas Teknologi Pertanian Universitas Katolik Widya Mandala Surabaya.

Kuswardani, I., Ch. Y. Trisnawati, dan Faustine. 2008. Kajian Penggunaan Xanthan Gum pada Roti Tawar Non Gluten yang Terbuat dari Maizena, Tepung Beras, dan Tapioka, *Jurnal Teknologi Pangan dan Gizi*, 7 (1): 55-65.

Lazaridou, A., D. Duta, M. Papagcorgiou, N. Bele and C. G. Biliaderls. 2007. Effects of Hidrocolloids on Dough Rheology and Bread Quality Parameters in Gluten-Free Formulations. *Journal of Food Engineering* 79:1033-1047.

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

Luh, B. S. (Ed). 1991. *Rice Utilization Second Edition Volume II*. New York: Van Nostrand Reinhold.

Matz, S.A. 1972. *Cookie and Cracker Technology*. Connecticut: The AVI Publishing Co.

Matz, S. A. 1991. *Chemistry and Technology of Cereals as Food and Feed.* New York: Springer Science & Business Media.

Matz, S. A. and T. D. Matz. 1978. *Cookies and Cracker Technology.* Connecticut: The AVI Publishing Co.

McKetta, J. J. (Ed). 1999. *Encyclopedia of Chemical Processing and Design Volume 67*. New York: Marcel Deker, Inc.

McWilliams, M. 1997. *Foods Experimental Perspectives, 3rd Edition*. New Jersey: Prentice-Hal Inc.

Moskowitz, H. R. 1987. *Instrumental and Sensory: Measurement Food Texture*. New York: Marcel Dekker, Inc.

Muchtadi, T. R. dan Sugiyono. 1992. *Petunjuk Laboratorium Ilmu Pengetahuan Bahan Pangan*. Bogor: PAU Pangan dan Gizi IPB.

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, *Jurnal Teknosains Pangan* 2(1): 20-29.

Petersen, N.B. 1975. *Edible Starches and Starch-Derived Syrups*. New Jersey: Noyes Data Corporation

Pomeranz, Y. dan C. E. Meloan. 1991. *Food Analysis: Theory and Practice.* Connecticut: The AVI Publishing Company, Inc.

Potter, N. N. and J. H. Hotchkiss. 1998. *Food Science Fifth Edition*. Gaithersburg: Aspen Publishers, Inc.

Pyler, E. J. 1973. *Baking Science and Technology*. Chicago: Siebel Publishing Company.

Ratnayake, W. S. and M. A. Hutchison (Eds). 2010. *An Industry-Relevant Analysis of Differences Between Products Made With Eggs and Those Made With Egg Content Reduced by Egg Replacers*. USA: University of Nebraska-Lincoln.

Roshental, A.J. 1999. *Food Texture Measurement and Perception*. Maryland: Aspen Publisher, Inc.

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. http://drum.lib.umd.edu/bitstream/handle/1903/1850/umi-umd-1843.pdf;jsessionid=A7FC2B48CA327EC1742D8804FC0277FC?sequence=1 (15 Oktober 2015).

Saputra, R. 2013. Karakteristik Fisikokimia dan Organoleptik *Cake* Beras dengan Proporsi Margarin dan Kacang Merah Kukus, *Skripsi S-1*, Fakultas Teknologi Pertanian UKWMS, Surabaya.

Stephanie dan R. Jaworski. 2009. *Baking Powder and Baking Soda (Bicarbonate)*. http://www.joyofbaking.com/bakingsoda.html (22 Maret 2013).

Stephannie, 2012. Karakteristik Fisikokimia dan Organoleptik *Cake* Beras dengan Proporsi Margarin dan Kacang Tunggak. *Skripsi S-1*. Surabaya: Fakultas Teknologi Pertanian Universitas Katolik Widya Mandala Surabaya.

Sudarmardji, S., B. Haryono, dan Suhardi, 1997. *Prosedur Analisa Bahan Makanan dan Pertanian.* Yogyakarta: Liberty.

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.

Tranggono, S., Haryadi, Suparmo, A. Murdiati, S. Sudarmadji, K. Rahayu, S. Naruki dan M. Astuti. 1991. *Bahan Tambahan Makanan (Food Additive)*. Yogyakarta: PAU Pangan dan Gizi UGM.

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 Katolik Widya Mandala Surabaya.

Trisnawati, Ch. Y. dan A. M. Sutedja. 2014. Pengembangan Penepungan Kacang Merah sebagai *Fat Replacer* pada *Cake* Beras Rendah Lemak Melalui Penyangraian dan Pengovenan. *Laporan Penelitian*. Pusat Penelitian Pangan dan Gizi. Lembaga Penelitian dan Pengabdian Masyarakat. Surabaya: Universitas Katolik Widya Mandala Surabaya.

United States Department of Agriculture. 2015a. *Basic Report: 01123, Egg, Whole, Raw, Fresh*. http://ndb.nal.usda.gov/ndb/foods/show/112?fgcd=&manu=&lfacet=&format=&count=&max=35&offset=&sort=&qlookup=egg (30 Agustus 2015)

United States Department of Agriculture. 2015b. *Basic Report: 01124, Egg, White, Raw, Fresh*. http://ndb.nal.usda.gov/ndb/foods/show/113?fgcd=&manu=&lfacet=&format=&count=&max=35&offset=&sort=&qlookup=egg (30 Agustus 2015)

United States Department of Agriculture. 2015c. *Basic Report: 01125, Egg, Yolk, Raw, Fresh*. http://ndb.nal.usda.gov/ndb/foods/show/114?fgcd=&manu=&lfacet=&format=&count=&max=35&offset=&sort=&qlookup=egg (30 Agustus 2015)

Walstra, P. 1983. *Dairy Chemistry and Physics*. New York: John Willey and Sons.

Wang, R. 2013. Karakteristik Sifat Fungsional Kacang Merah Rebus dengan Variasi Waktu Perebusan, *Skripsi S-1*, Fakultas Teknologi Pertanian UKWMS, Surabaya.

Whitehurst, Robert J. and M. V. Oort. 2010. *Enzymes in Food Technology Second Edition*. Chichester: Blackwell Publishing Ltd.

Widija, S. L. J. 2014. Penggunaan Na-CMC dan Gum Xanthan untuk Memperbaiki Kualitas *Cake* Beras Rendah Lemak, *Skripsi S-1*, Fakultas Teknologi Pertanian UKWMS, 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 (12 November 2014).

Williams, P. 2011. Characterization Of Physicochemical Properties of Xanthan/Curdlan Hydrogel Complex for Applications in Frozen Food Products. *Dissertation*. Faculty of the Graduate School of the University of Maryland, College Park. http://drum.lib.umd.edu/bitstream/1903/12105/1/Williams_umd_0117E_12389.pdf (10 November 2014)

Winarno, F. G. 1993. *Pangan Gizi, Teknologi dan Konsumen*. Jakarta: PT. Gramedia Pustaka Utama.

Winarno, F.G. 2004. *Kimia Pangan*. Jakarta: PT. Gramedia Pustaka Utama.

Wong, D. S. (Ed). 1989. *Mechanism and Theory in Food Chemistry*. New York: Van Nostrand Reinhold.

Wrolstad, R. E., R. W. Durst, and J. Lee. 2005. Tracking Color and Pigment Changes in Anthocyanin Products, *Trends in Food Science & Technology*, 2005(16): 423-428.

Young, S. L. and C. F. Shoemaker. 1990. Measurement of Shear Dependent Intrinsic Viscosities of Carboxymethyl Cellulose and Xanthan Gum Suspensions. *Journal of Applied Polymer Science* 42, 2405-2408.