

BAB V

KESIMPULAN DAN SARAN

5.1. Kesimpulan

1. Perbedaan proporsi tepung kacang merah dan tepung beras putih berpengaruh terhadap sifat fisikokimia *flakes* yaitu kadar air, daya serap air, *hardness*, warna, aktivitas antioksidan, kadar total antosianin dan kemampuan reduksi ion besi.
2. Proporsi *flakes* 0:100 memberikan nilai kadar air dan *hardness* tertinggi (5,84% dan 1155,277 g), tetapi memiliki nilai daya serap air terendah (69,93%). .
3. *Flakes* dengan proporsi 0:100 memiliki nilai *lightness* dan *chroma* yang paling rendah rendah (58,1 dan 15,8). Nilai *hue* menunjukkan *flakes* masuk dalam kategori warna merah (*Red*) dan merah kekuningan (*Yellow Red*).
4. Proporsi *flakes* 0:100 memiliki nilai kadar total antosianin tertinggi (0,7973 mg/100 g) sehingga mempengaruhi nilai aktivitas antioksidan dan kemampuan reduksi ion besi. *Flakes* proporsi 0:100 memiliki nilai aktivitas antioksidan dan kemampuan reduksi ion besi tertinggi yaitu 26,76 % penangkapan radikal bebas dan 0,0549 mg/g.

5.2. Saran

Perlu dilakukan uji organoleptik untuk mengetahui proporsi *flakes* yang paling disukai panelis sehingga dapat dikembangkan lebih lanjut sebelum diproduksi dan dipasarkan.

DAFTAR PUSTAKA

- Altamirano-Fortoul, R., I. Hernando, and C.M. Rosell. 2012. Texture of Bread Crust: Puncturing Settings Effect and Its Relationship to Microstructure. *Journal of Texture Studies*, ISSN 1745-4603.
- Abers, J.E. and R.E. Wrolstad. 1979. Causative factors of Colour Deterioration in Strawberry Preserves during Processing and Storage. *Journal of Food Science*, 44(1): 75-81.
- Akond, A.S.M.G.M., L. Khandaker, J. Berthold, L. Gates, K. Peters, H. Delong and K. Hossain. 2011. Anthocyanin, Total Polyphenols and Antioxidant Activity of Common Bean. *American Journal of Food Technology*, 6: 385-394.
- Ambarawati, M. 2007. Analisis Faktor-Faktor yang Mempengaruhi Produksi dan Ekspor Beras Indonesia. *Skripsi S-1*. Institut Pertanian Bogor, Bogor. www.repository.ipb.ac.id/handle/123456789/7472/browse?value=A mbarinanti %2C+Marissa&type=author. (11 Januari 2018).
- Andarwulan, N.P. dan S. Koswara. 2010. Potensi Kecambah Kedelai Sebagai Sumber Protein, Asam Folat, dan Asam Lemak Tidak Jenuh Dalam Produk Sarapan Bergizi Untuk Anak-Anak. *Prosiding Seminar Nasional Inovatif Pascapanen*, Bogor.
- Anam. 2017. *Jenis-Jenis Padi*. <http://mediatani.co/jenis-jenis-padi>. Diunduh pada 14 Januari 2018.
- Anderson, J.W., P. Baird, R.H. Davis, S. Ferreri, M. Knudtson, A. Koraym, V. Waters, and C.L. Williams. 2009. Health Benefits of Dietary Fiber. *Nutrition Review*, 67(4): 188-205.
- AOAC. 1990. *Official Methods of Analysis of The Association of Official Analytical Chemist*. 25th Ed. USA : Publisher AOAC Inc
- Apriani, RN. 2009. Mempelajari Pengaruh Ukuran Partikel dan Kadar Air Tepung Jagung Serta Kecepatan Ulin Ekstruder Terhadap Karakteristik Snack Ekstrusi. *Skripsi S-1*. Program Pasca Sarjana. Institut Pertanian Bogor.

- Arsa, M. 2016. *E-book Proses Pencoklatan (Browning Process) Pada Bahan Pangan.* <http://erepo.unud.ac.id/2674/1/39d25529666391a5efb308dbdc412214.pdf>. Diunduh pada 5 Juni 2018.
- Astawan, M. 2009. *Sehat dengan Hidangan Kacang dan Biji-Bijian.* Jakarta: Swadaya.
- Babu, P.D., R. Vidhyalakhsmi and R.S. Subhasree. 2009. Brown Rice- Beyond the Color Reviving a Lost Health Food – A Review. *American-Eurasian Journal of Agronomy*, 2.
- Badan Pusat Statistik. 2016. *Tabel Produksi Kacang Merah Tahun 2016.* <https://www.bps.go.id/site/resultTab>. Diunduh pada 09 Oktober 2017.
- Badan Standarisasi Nasional. 1996. *Standar Nasional Indonesia. Syarat Mutu Flakes. SNI 01-4270-1996.* Badan Standarisasi Nasional, Jakarta.
- Battala-Diaz, L., J.M. Widholm, G.C. Jr. Fahey, E. Castano-Tostado dan O. Paredes-Lopez. 2006. Chemical Components With Health Implications in Wild and Cultivated Mexican common bean seeds. *J. Agric.Food.Chem*, 54(6):2042-52.
- Belitz, H. D., W. Grosch, P. Schieberle. 2009. *Food Chemistry 4th revised and extended edition.* Germany: Springer-Verlag Berlin Heidelberg.
- 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.
- Bowen, R. 2003. *Free Radicals and Reactive Oxygen.* http://www.vivo.colostate.edu/hbooks/pathphys/misc_topics/radicals.html. Diunduh pada 11 Januari 2018.
- Cadavid, E.L.A., D.A.R. Molina and J.R.C. Valenzuela. 2015. Chemical, Physicochemical and Functional Characteristics of Dietary Fiber Obtained from Asparagus Byproducts (Asparagus officinalis L.). *Rev. Fac. Nal. Agr. Medellin*, 68(1): 7533-7544.

- Camire, M.E., M.P. Dougherty, J.L. Briggs. 2007. Functionality of Fruit Powders in Extruded Corn Breakfast Cereal. *Food Chemistry*, 101: 765-770.
- Carvalho, A.V., R.A. Mattietto, P.Z. Bassinello, S.N. Koakuzu, A.O. Rios, R.A. Maciel and R.N. Carvalho. 2012. Processing and Characterization of Extruded Breakfast Meal Formulated with Broken Rice and Bean Flour. *Cienc. Tecnol. Aliment. Campinas*, 32(3): 515-524.
- Cassidy, A., E.J. O'Reilly, C. Kay, L. Sampson, M. Franz, J. Forman, G. Curhan and E.B. Rimm. 2010. Habitual Intake of Flavonoid Subclasses and Incident Hypertension in Adults. *Am. J Clin. Nutr.*, 93, 338-47.
- Cata, A., M.N. Stefanut, R. Pop, C. Tanasie, C. Mosoarca and A.D. Zamfir. 2016. Evaluation of Antioxidant Activity of Some Small Fruits Containing Anthocyanins Using Electrochemical and Chemical Methods. *Croat. Chem. Acta*, 89(1): 37-48.
- Chevalier, S., P. Collona and D. Loundin. 2000. Contribution of Major Ingredients during Baking of Biscuit Dough Systems. *Journal of Cereal Science*, 37: 241-252.
- Chou, D.H and C.V. Morr. 1976. Protein-Water Interactions and Functional Properties. *J. Am. Chi. Chemistry*, 56: 53-62.
- Chung, H.J., A. Cho, S.T. Lim. 2014. Utilization of Germinated and Heat-Moisture Treated Brown Rice in Sugar-Snap Cookies. *LWT-Food Science and Technology*, 57: 260-266.
- DeGraft-Johnson, J., K. Kolodziejczyk, M. Krol, P. Nowak, B. Krol and D. Nowak. 2007. Ferric-Reducing Ability Power of Selected Plant Polyphenols and Their Metabolites: Implications for Clinical Studies on the Antioxidant Effects of Fruits and Vegetable Consumption. *Basic & Clinical Pharmacology & Toxicology*, 100: 345-352.
- De La Torres, M., M.E. Baron, M.N. Riaz and L.W. Rooney. 2003. *The Properties of Baked and Fried Tortilla Chips Fortified with Mechanically-expelled Soy Flour*. Poster Presented at AACC Meeting. Portland USA. 28 September-2 Oktober 2003.

- Dewi, S. 2016. Pengaruh Substitusi Terigu dengan Tepung Kacang Merah Pregelatinisasi Terhadap Sifat Fisikokimia dan Organoleptik Cookies. *Skripsi S-1*. Fakultas Teknologi Pertanian, Universitas Katolik Widya Mandala Surabaya. <http://www.repository.wima.ac.id/6254/49>. Diunduh pada 29 April 2018.
- Duke, J. A. 1981. *Handbook of Legumes of World Economic Importance*. New York: Plenum Press.
- Eastwood, M. A., R. Anderson, W.D. Mitchel, J. Robertson and S. Procock. 1976. A Method to Measure the Adsorption of Bile Salts to Vegetable Fibre of Different Water Holding Capacity. *Journal of Nutrition*, 106: 1429-1435.
- Eisenbrand, G. 2007. *Thermal Processing of Food: Potential Health Benefits and Risks*. Weinheim: WILEY-VCH Verlag GmbH & Co.
- Eliasson AC. 2004. *Starch in food : structure, function and applications*. Cambridge: Woodhead Publishing Limited. 1:341-344.
- Encyclopedia Britannica. Rice cereal grain. <http://www.britannica.com/plant/rice>. Diunduh pada 07 Oktober 2017.
- Filipcev, B., N. Nedejkovic, O. Simurina, M. Sakac, M. Pestoric, D. Jambrec, B. Saric and P. Jovanov. 2017. Partial Replacement of Fat with Wheat Bran in Formulation of Biscuits Enriched with Herbal Blend. *Hem. Ind*, 71(1): 61-67.
- Giantiva, M.A. 2015. Pengaruh Metode Oven dan Sangrai Pada Penepungan Kacang Merah Kukus Terhadap Karakteristik Tepung dan Cake Beras Rendah Lemak. *Skripsi S-1*, Fakultas Teknologi Pertanian Universitas Katolik Widya Mandala, Surabaya.
- Grist, D.H. *Rice 5th Edition*. USA: Longman.
- Gross, J. 1991. *Pigments in Vegetables: Chlorophylls and Carotenoids*. New York: Van Nostrand Reinhold.

- Guha, M. 2000. Processing and Quality of Rice-Based Extruded Products. *Thesis Ph.D.* Department of Grain Science and Technology. Jadapur University.
- Guine, R.D.P.F. and P.M.D.R. Correia. 2014. *Engineering Aspects of Cereal and Cereal Based Products*. Boca Raton: CRC Press.
- Gupta, R. K. 1990. *Processing of Fruit Vegetables and Other Food Processing (Process Food Industries)*. New Delhi: SBP of Consultant Engineers.
- Harborne, A.J. 1998. *Phytochemical Methods A Guide to Modern Techniques of Plant Analysis*. Netherlands: Springer.
- Harijono, L.S. 2014. Sifat Fungsional Kacang Merah Kukus dengan Variasi Waktu Pengukusan. *Skripsi S-1*. Fakultas Teknologi Pertanian Universitas Katolik Widya Mandala, Surabaya.
- Hartayanie, L. dan C. Ratnaningsih. 2006. Pemanfaatan Tepung Kacang Merah Sebagai Pengganti Tepung Terigu dalam Pembuatan Roti Tawar: Evaluasi Sifat Fisiokimia dan Sensoris. *Laporan Akhir Penelitian*. Universitas Katolik Soegijapranata, Semarang.
- Hendarsono, H. 1984. *Produktifitas dan Sifat Fisiko Kimia Pati Kacang Merah (Kacang Merah Pinnata Merr) di Pengolah Kedung Halang Kabupaten Bogor*. Bogor: IPB.
- Hodge, J.E. 1953. Dehydrated Foods: Chemistry of Browning Reactions in Model Systems. *Journal of Agricultural and Food Chemistry*, 1(15): 928–943.
- Huang, D.P. dan L.W. Rooney. 2001. *Snack Food Processing*. USA: CRC Press.
- Hubeis, M. 1984. *Pengantar Pengolahan Tepung Serealia dan Biji-Bijian*. Bogor: Institut Pertanian Bogor.
- Hutchings, J.B. 1999. Food Colour and Appearance 2nd Edition. Gaithersburg: Springer

- Hwang, J.Y. and W.C. Sung. 2012. Effect of Mulberry Less Addition on the Quality of Bread and Anthocyanin Content. *Journal of Marine and Technology*, 20(5): 565-569.
- Immaningsih, N. 2012. Profil Gelatinisasi Beberapa Formulasi Tepung-Tepungan Untuk Pendugaan Sifat Pemasakan. *Penelitian Gizi Makan*, 35(1).
- Ionita, P. 2005. Is DPPH Stable Free Radical a Good Scavenger for Oxygen Active Species?. *Chem. Pap.*, 59(1): 11-16.
- Jane, J., Y.Y. Chen, L.F. Lee, A.E. McPherson, K.S. Wong, M. Radosavljevic dan T. Kasemsuwan. 1999. Effect of Amylopectin Branch Chain Length and Amylose Content on the Gelatinization and Pasting Properties of Starch. *Cereal Chem*, 76:629-637.
- Jati, I.R.A.P., D. Nohr, and H.K. Biesalski. 2013. Nutrients and Antioxidant Properties of Indonesian Underutilized Colored Rice. *Nutrition & Food Science*, 44(3): 193-203.
- Juliano, B.O. 1972. *The Rice Caryopsis and Its Composition*. Phillipines: The International Rice Research Institute.
- Kay, C. 2004. Analysis of the Bioactivity, Metabolism, and Pharmacokinetics of Anthocyanins in Humans. *Thesis Ph.D.* University of Guelph, Ontario, Canada.
- Kay, D.E. 1979. *Crops and Product Digest Number 3: Food Legumes*. London: Tropical Products Institute.
- KEBS. *Breakfast Cereals – Specification, Draft Kenya Standard 3rd Edition*. Kenya: Kenya Bureau of Standards.
- Kusnadar, Feri. 2010. *Kimia Pangan: Komponen Pangan*. Jakarta: PT. Dian Rakyat.
- Lenggosari. 2008. *Paduan Warna Menarik untuk Rumah*. Jakarta: Penebar Swadaya.
- Lima, A.D.J.B., A.D. Correa, A.A. Saczk, M.P. Martins and R.O. Castilho. 2011. Anthocyanins, Pigment Stability and Antioxidant Activity in Jabuticaba (*Myrciaria cauliflora* Mart. O. Berg. *Rev. Bras. Fruitec. Jaboticabal*, 33(3): 877-887.

- Lingkar Organik. 2017. *Spesifikasi Tepung Kacang Merah dan Tepung Beras Putih*. Komunikasi Langsung. (20 September 2017).
- Linko, P.; Colonna, P.; Mercier, C. 1981. High temperature, short time extrusion-cooking. *Advances in Cereal Science and Technology*, 4: 145–235
- Li-Sun, L. W. Gao, M. M. Zhang, C. Li, A.G. Wang, Y.L. Su and T.F. Ji. 2014. Composition and Antioxidant Activity of the Anthocyanins of the Fruit *Berberis heteropoda* Schrenk. *Molecules*, 19: 19078-19096.
- Liu, Y.K and B.S. Luh. 1980. *Rice: Production and Utilization*. USA: AVI Publishing Company Inc.
- Loebis, E.H., L. Junaidi, dan I. Susanti. 2017. Karakterisasi Mutu dan Nilai Gizi Nasi Mocaf dari Beras Analog. *BIOPROPAL Industri*, 8(1): 33-46.
- Luh, B. S., (Ed). 1991. *Rice, Volume 2: Utilization*. New York : AVI Book.
- Luzuriaga, D. and M.O. Balaban, M. O. 2002. *Color Machine Vision System: An Alternative for Color Measurement*. Florida: F.S. Zazueta and J. Xin. Publication.
- Marsono Y. 2003. *Penentuan Indeks Glikemik Kacang-Kacangan, Faktor Determinan, dan Efek Hipoglisemiknya (KTI)*. Yogyakarta: UGM.
- Martinez-Preciado, A.H., Y. Estrada-Giron, A. Gonzales-Alvarez, V. V. A. Fernandez, E.R. Macias and J. F. A. Soltero. 2014. Physicochemical, Morphological and Rheological Properties of Canned Bean Pastes “Negro Queretaro” Variety (*Phaesolus vulgaris* L.). *J. Food.Sci.Technol*, 51(9): 1795-1805.
- Mateus, N. 2009. *Anthocyanins. Biosynthesis , Functions and Applications*. New York: Springer.
- Matz, S.A. 1970. *Bakery Technology and Engineering*. Westport: The AVI Publishing Company.
- Mercier, C., P. Linko and J.M. Harper. 1998. *Extrusion Cooking 2nd Ed.* USA: American Association of Cereal Chemist.

- Miguel, M.G. 2011. Anthocyanins: Antioxidant and/or Anti-Inflammatory Activities. *Journal of Applied Pharmaceutical Science*, 1(6): 07-15.
- Moraru, C. I. and J.L. Kokini. 2003. Nucleation and Expansion During Extrusion and Microwave Heating of Cereal Foods. *Comprehensive Reviews in Food Science and Food Safety*, 2: 120-138.
- Nakajima, J., I. Tanaka, S. Seo, M. Yamazaki and K. Saito. 2004. LC/PDA/ESI-MS Profiling and Radical Scavenging Activity of Anthocyanins in Various Berries. *J. Biomedicine and Biotechnology*, 5: 241-247.
- Natural Resources Conservation Service. 2015. *Phaseolus vulgaris L.* Kidney Bean. <http://plants.usda.gov/core/profile?symbol=PHVU>. Diunduh pada 09 Oktober 2017.
- Ombra, M.N., A. d'Acierno, F. Nazzaro, R. Riccardi, P. Spigno, M. Zaccardelli, C. Pane, M. Malone, and F. Fratianni. 2016. Phenolic Composition and Antioxidant and Antiproliferative Activities of the Extracts of Twelve Common Bean (*Phaseolus vulgaris* L.) Endemic Ecotypes of Southern Italy Before and After Cooking. *Oxidative Medicine and Cellular Longevity*, 1398298: 1-12.
- Park, Y.S., S.J. Kim, and H.I. Chang. 2008. Isolation of Anthocyanins from Black Rice (Heugjinjabyeo) and Screening of Its Antioxidant Activities. *Journal of Microbial Biotechnology* 36(1): 55-60.
- Patras, A., N.P. Brunton, C. O'Donell, and B.K. Tiwari. 2010. Effect of Thermal Processing on Anthocyanin Stability in Foods; Mechanisms and Kinetics of Degradation. *Trends in Food Science and Technology*, 21:3-11.
- Permana, R.A. dan W.D.R. Putri. 2015. Pengaruh Proporsi Jagung dan Kacang Merah Serta Substitusi Bekatul Terhadap Karakteristik Fisik Kimia Flakes. *Jurnal Pangan dan Agroindustri*, 3(2): 734-742.
- Philpott, M. C.C. Lim and L.R. Ferguson. 2009. Dietary Protection Against Free Radicals: A Case for Multiple Testing to Establish Structure-Activity Relationships for Antioxidant Potential of Anthocyanic Plant Species. *Int. J. Mol. Sci*, 10(3): 1081-1103.

- Pokorny, J. N. Yanishivela and M. Gordon. 2001. *Preparation of natural antioxidant, in Antioxidants in Food: Practical Applications, 1st ed.* England: Woodhead Publishing Limited.
- Preciado-Martinez, A.H., Y. Estrada-Giron, A. Gonzales-Alvares, V.V.A. Fernandez, E.R. Marcias and J.F.A. Soltero. Physicochemical, Morphological and Rheological Properties of Canned Bean Pastes “negro Queretaro” Variety (*Phaseolus vulgaris L.*). *J. Food. Sci. Technol.*, 51(9): 1795-1805.
- Pribadi, I. 2009. Uji Aktivitas Penangkap Radikal Buah Psidium Guajava L. dengan Metode DPPH (1,1-Difenil-2-Pikril Hidrazil) serta Penetapan Kadar Fenolik dan Flavanoid Totalnya. *Skripsi S-1*. Fakultas Farmasi Universitas Muhammadiyah Surakarta. <https://etd.eprints.ums.ac.id/5893/1/K100050061.pdf> Diunduh pada 17 Oktober 2017.
- Radley, J.A. 1954. *Starch and Its Derivatives*. New York: John Wiley and Sons Inc.
- Rahim A. 2007. Pengaruh Cara Pengolahan Instant Starch Noodle dari Pati Kacang Merah Terhadap Sifat Fisikokimia Dan Sensoris. Yogyakarta, *Tesis S-2, Teknologi Pengolahan Hasil Perkebunan Fakultas Teknologi Pertanian Universitas Gadjah Mada, Yogyakarta*. eprints.ugm.ac.id/36533/1/TESIS_rhm1.pdf .Diunduh pada 11 Januari 2018.
- Rakhmawati, N., B.S. Amanto dan D. Praseptiangga. 2014. Formulasi dan Evaluasi Sifat Sensoris dan Fisikokimia Produk Flakes Komposit Berbahan Dasar Tepung Tapioka, Tepung Kacang Merah (*Phaseolus vulgaris L.*) dan Tepung Konjac (*Amorphophallus oncophillus*). *Jurnal Teknosains Pangan*, 3(1): 63-73.
- Ranggana, S. 1979. *Manual of Analysis for Fruit and Vegetable Product*. India: Mc. Graw Hill Publishing Company Limited.
- Rice-Evans, C.A., N.J. Miller and G. Paganga. 1996. Structure Antioxidant Activity Relationships of Flavonoids and Phenolic Acids. *Free Radical Biology and Medicine*, 20(7): 933-956.
- Rice-Evans, C.A., N. Miller and G. Paganga. 1997. Antioxidant Properties of Phenolic Compounds. *Trends in Plant Science*, 2(4): 152-159.

- Robin, F., C. Théoduloz, A. Gianfrancesco, A. N. Pineau, H. Schuchmann, S. Palzer. 2011: Starch Transformation in Bran-Enriched Extruded Wheat Flour. *Carbohydrate Polymers*, 85: 65-74
- Rukmana. 1998. *Bertanam Kacang Merah*. Yogyakarta: Kanisius.
- Sacchetti, G., P. Pittia, M. Biserni, G.G. Pinnavaia and M.D. Rosa. 2003. Kinetic Modelling of Textural Changes in Ready to Eat Breakfast Cereals during Soaking in Semi-Skimmed Milk. *International Journal of Food Science and Technology*, 38: 135-143.
- Salunkhe, D.K., J.K. Chavan dan S.S. Kadev. 1985. *Postharvest Biotechnology of Food Legumes*. Florida: CRC Press Inc.
- Santoso, L. 2005. Antioksidan Ekstrak Pollard Gandum Sistem Model Asam Linoleat Beta Karoten. *Skripsi S-1*. Surabaya: Fakultas Teknologi Pertanian, Universitas Katolik Widya Mandala Surabaya.
- Santoso, U., T. Murdaniningsih dan M. Rob. 2007. Produk Ekstrusi Berbasis Tepung Ubi Jalar. *Jurnal Teknol. Dan Industri Pangan*, 17(1): 41.
- Sari, D. C. 2009. Aktivitas Antioksidan Daun Belantas dalam Sistem Model Asam Linoleat Beta Karoten. *Skripsi S-1*. Surabaya: Fakultas Teknologi Pertanian, Universitas Katolik Widya Mandala Surabaya.
- Sathe, S., K. V. Iyer, and D. K. Salunkhe. 1981. Investigations of the Great Northern Bean (*Phaseolus vulgaris* L.) Starch: Solubility, Swelling, Interaction with Free Fatty Acids, and Alkaline Water Retention Capacity of Blends with Wheat Flours. *Journal of Food Science*, 46 (6):1914-1917.
- Schafer, F. Q. and G.R. Buettner. 2001. Redox Environment of the Cell as Viewed Through the Redox State of the Gluthathione Disulfide/Gluthathione Couple. *Free Radical Biology Medicinal*, 30(11): 1191-1212.
- Shahidi, F. and M. Naczk. 2004. Extraction and Analysis of Phenolics in Food. *J. Chromatogr*, 1054(1-2): 95-111.

- Sharma, O.P. and T.K. Bhat. 2009. DPPH Antioxidant Assay Revisited. *Food Chemistry*, 113(4): 1202-1205.
- Sharma, N., A. Kumari and T. Sharma. 2002. Effect of Various Home Processing on the Nutritive Quality of Legumes. *Indian J. of Nutrition and Dietetics*, 39: 396-403.
- Shehzad, A., U.M. Chander, M.K. Sharif, A. Rakha, A. Ansari and M.Z. Shuja. 2015. Nutritional, Functional and Health Promoting Attributes of Red Kidney Beans: A Review. *Pak. J. Food Sci.*, 25(4): 235-246.
- Shenoy R. and A. Shirwaikar. 2002. Anti-inflammatory and free radical scavenging studies of Hyptis suaveolens (Labiatae). *Indian Drugs*, 39(11):574-57.
- Shoichi, I. 2004. Marketing of Value-Added Rice Products in Japan: Germinated Brown Rice and Rice Bread, *FAO Rice Conference*, Rome, Italy. February 12-13, 2004.
- Sirichokworrakit, S., A. Maneewong, and A. Klongchai. 2017. Effects of Partial Substitution with Rice Berry Flour on Quality of Fried Donut. *International Journal of Advances in Science Engineering and Technology*, 5(1): 9-13.
- Siwi, B.H. dan D.S. Damardjati. 1986. Perkembangan dan Kebijaksanaan Produksi Beras Nasional. *Makalah Konsultasi Teknik Pengembangan Industri Pengolahan Beras Non Nasi*, Jakarta.
- Smith, P.S. 1982. *Starch Derivatives and Their Uses in Foods* dalam D.R. Lineback dan G.E. Inglett (eds). *Food Carbohydrate*. USA: AVI Publishing Co.Inc.
- Sompong, R., S. Siebenhandl-Ehn, G. Linsberger-Martin, and E. Berghofer. 2011. Physicochemical and antioxidative properties of red and black rice varieties from Thailand, China and Sri Lanka. *Food Chemistry*, 124(1), 132-140.
- Suarni. 2009. Produk Makanan Ringan (Flakes) Berbasis Jagung dan Kacang Hijau Sebagai Sumber Protein Untuk Perbaikan Gizi Anak Usia Tumbuh. *Prosiding Seminar Nasional Serealia*, Bogor.

- Susanti, I., E.H. Lubis dan S. Meilidayani. 2017. Flakes Sarapan Pagi Berbasis Mocaf dan Tepung Jagung, *Warta IHP*, 34(1): 44-52.
- Sutedja, A.M. dan Trisnawati, Yayuk C. 2013. Pemanfaatan Tepung Beras Ketan Hitam (*Oryza Sativa Glutinosa L.*) Pregelatinisasi Pada Produk Flakes. *Prosiding Seminar Nasional PATPI*, Jember.
- Tamanna, N. and N. Mahmood. 2014. Food Processing and Maillard Reaction Products: Effect on Human Health and Nutrition. *International Journal of Food Science*, 2015:1-6.
- Tandijo, Y. P. 2011. Efektivitas Angkak dalam Memperpanjang Umur Simpan Minuman Sari Kacang Merah. *Skripsi S-1*. Program Studi Teknologi Pangan, Institut Pertanian Bogor, Bogor.
- Tribelhorn, R.E. 1991. *Breakfast Cereals: Handbook of Cereal Science and Technology*. New York: Marcel Dekker Inc.
- Trilaksani, W. 2003. *Antioksidan: Jenis, Sumber, Mekanisme Kerja dan Peran Terhadap Kesehatan*. Bogor: Institut Pertanian Bogor.
- Trisyulianti, E., J. Jacjha dan Jayusmar. 2001. Pengaruh Suhu dan Tekanan Pengempaan Terhadap Sifat Fisik Wafer Ransum dari Limbah Pertanian Sumber Serat dan Leguminose untuk Ternak Ruminansia. *Prosiding Media Peternakan*. Bogor.
- Triyono, A. 2010. *Pengaruh Maltodekstrin dan Subtitusi Tepung Pisang (*Musa paradisiaca*) Terhadap Karakteristik Flakes*. Balai Besar Pengembangan Teknologi Tepat Guna, LIPI. Yogyakarta.
- Vichapong, J., M. Sookserm., V. Srijesdaruk., P. Swatsitang., and S. Srijaranai. 2010. High Performance Liquid Chromatographic Analysis of Phenolic Compounds and Their Antioxidant Activities in Rice Varieties, *Journal of Food Science and Technology*. 43: 1325-1330.
- Vijitha, P. K. and K. Nizar. 2009. Role of Antioxidants in Biological System. Artikel. <http://farmacists.blogspot.com/2009/05/role-of-antioxidants-in-biological.html> Diunduh pada 11 Januari 2018.

- Wang, G. X. Huang, D. Pei, W. Duan, K. Quan, X. Li and D. Di. 2016. DPPH-HPLC-DAD Analysis Combined HSCCC for Screening and Identification of Radical Scavengers in Cyonmorium songaricum Rupr. *New J. Chem*, 40: 3885-3891.
- Wanyo, P., S. Siriamornpun and C. Chomnawang. 2009. Substitution of Wheat Flour with Rice Flour and Rice Bran in Flake Products: Effects on Chemical, Physical and Antioxidant Properties. *World Applied Science Journal*, 7(1): 49-56.
- Widyawati, P.S., P. Monika dan A.M. Sutedja. 2014. Perubahan Kadar Senyawa Bioaktif dan Aktivitas Antioksidan Beras Organik Merah Varietas Lokal Dalam Kemasan Polipropilen dengan Variasi Lama Penyimpanan. *Jurnal Teknologi Pangan dan Gizi*, 13(1): 1-5.
- Winarno, F.G. 1984. *Kimia Pangan dan Gizi*. Jakarta: PT. Gramedia Pustaka Utama.
- Winarno, F.G. 1992. *Kimia Pangan dan Gizi*. Jakarta: PT. Gramedia Pustaka Utama.
- Winarno, F. G. 1997. *Kimia Pangan dan Gizi*. Jakarta: PT. Gramedia Pustaka Utama.
- Winarsi, H. 2007. *Antioksidan Alami & Radikal Bebas: Potensi dan Aplikasinya dalam Kesehatan*. Yogyakarta: Penerbit Kanisius.
- Wrolstad, R.E., R.W. Durst, and J. Lee. 2005. Tracking Color and Pigment Changes in Anthocyanin Products. *Trends in Food Science and Technology*, 16: 423-428.
- Zahro, C. dan F.C. Nisa. 2015. Pengaruh Penambahan Sari Anggur (*Vitis vinifera L.*) dan Penstabil Terhadap Karakteristik Fisik, Kimia dan Organoleptik Es Krim. *J. Pangan dan Agroindustri*, 3(4): 1481-1491.