

BAB VI

KESIMPULAN DAN SARAN

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6.1. Kesimpulan

1. Campuran *bran-pollard* gandum dengan perlakuan B₅P₁₅E₃V₁₀₀ menghasilkan ekstrak sebesar 13,0698 gr/gr bahan dan total fenol sebesar 6,3560 mg TF/g bahan.
2. Konsentrasi antioksidan dari ekstrak campuran *bran-pollard* gandum (B₅P₁₅E₃V₁₀₀) mempunyai pengaruh nyata terhadap aktivitas antioksidan dalam sistem linoleat-β-karoten.
3. a. Aktivitas antioksidan (nilai AOA) ekstrak campuran *bran-pollard* gandum meningkat dengan bertambahnya konsentrasi dan optimum pada kisaran konsentrasi 200-250 ppm.
b. Aktivitas antioksidan ekstrak campuran *bran-pollard* gandum pada kisaran konsentrasi 0-250 ppm cenderung mempunyai pola kubik atau kuadratik.

6.2. Saran

1. Perlu dilakukan penelitian lebih lanjut untuk mencari konsentrasi maksimal ekstrak campuran *bran-pollard* gandum sebagai antioksidan.
2. Perlu dilakukan penelitian lebih lanjut untuk mencari mekanisme lain dalam ekstrak campuran *bran-pollard* gandum sebagai antioksidan.
3. Perlu dilakukan penelitian lebih lanjut untuk mencari atau menentukan dosis efektif penggunaan ekstrak campuran *bran-pollard* gandum pada berbagai macam produk pangan .

DAPTAR PUSTAKA

DAFTAR PUSTAKA

- Adom, K.K., Sorrells, M.E., dan Liu, R.H. 2003. *Phytochemical Profiles and Antioxidant Activity of Wheat Varieties*. Journal of Agricultural and Food Chemistry. 51:7825-2834.
- Astuti, M. 1996. *Tempe dan Antioksidan: Prospek Pencegahan Penyakit Degeneratif*. Bunga Rampai Tempe Indonesia. Jakarta: Yayasan Tempe Indonesia.
- Atwell, W.A. 2001. *An Overview of Wheat Development, Cultivation, and Production*. Cereal Foods World, 46(2):59-62.
- Baublis, A.J., Lu, C., Clydesdale, F.M., dan Decker, E. A. 2000. *Potential of Wheat Based Breakfast Cereals As a Source of Dietary Antioxidants*. Journal of the American College of Nutrition, 19(3):308S-311S.
- Benabadji, S.H., Wen, R., Zheng, J., Dong, X., dan Yuan, S. 2004. *Anticarcinogenic and Antioxidant Activity of Diindolymethane Derivatives*. Acta Pharmacologica Sinica, 25(5):666-671.
- Borek, C. 1999. *Antioxidants and Aging*. Life Extension Magazine.
- Chan, W.K.M., Faustman, C., dan Renerre, M. 1997. *Model Systems for Studying Pigment and Lipid Oxidation Relevant to Muscle-Based Foods*. Dalam F. Shahidi (Ed.) *Natural Antioxidants: Chemistry, Health Effects, and Application*. Illinois: AOCS Press.
- Concon, J. M. 1988. *Food Toxicology, Contaminants, and Additives*. Part B. New York: Marcel Dekker, Inc.
- Emmons, C.L. dan Peterson, D.M. 1999. *Antioxidant Activity and Phenolic Contents of Oat Groats and Hulls*. Cereal Chemistry 76(6):902-906.
- Eskin, N. A. M. dan Przybylski, R. 2001. *Antioxidants and Shelf Life of Foods*. Dalam N.A.M. Eskin (Ed.) *Food Shelf Life Stability, Chemical, Biochemistry, and Microbiological Changes*. USA: CRC Press LLC.
- Evans, W.C., 2002. *Pharmacognosy* 15th edition. USA: Saunders Elsevier.

- Foote, C.S. dan Denny, R.W. 1968. *Chemistry of Singlet Oxygen Quenching by β -Carotene*. Journal American Chemical Society, 90:6232-6238.
- Dalam Min, D.B. dan Boff, J.M. (2002). *Lipid Oxidation of Edible Oil*. New York: Marcel Dekker, Inc.
- Frankel, E., Huang, S.W., Kanner, J., dan German, J.B. 1994. *Interfacial Phenomena in the Evaluation of Antioxidants: Bulk Oils vs Emulsions*. Journal of Agricultural and Food Chemistry, 42:1054-1059.
- Dalam Suryanto, E., Raharjo, S., dan Tranggono (2003). *Antioxidant Activity of Andaliman (Zanthoxylum achanthopodium DC) Fruit Extract in Emulsion System*. Proceeding International Conference on Redesigning Sustainable Development on Food and Agricultural System for Developing Countries, p. 705-713.
- Garcia-Conesa, M.T., Wilson, P.D., Plumb, G.W., Ralph, J., dan Williamson, G. 1999. *Antioxidant Properties of 4,4'-Dihydroxy-3,3'-Dimethoxy- β,β' -Bicinnamic Acid (8-8-Diferulic Acid, Non Cyclic Form)*. Journal Science of Food Agriculture 79:379-384.
- Gertenbach, D.D. 2002. *Solid-Liquid Extraction Technologies for Manufacturing Nutraceuticals*. Dalam J. Shi, G. Mazza, M. Le Maguer (Ed.) *Functional Foods Vol. 2: Biochemical and Processing Aspects*. Florida: CRC Press.
- Gordon, M.H. 1990. *The Mechanism of Antioxidant Action in vitro*. Dalam B.J.F. Hudson (Ed.). *Food Antioxidant*. London: Elsevier Applied Science.
- Gunter, C. 2002. *Flour Basic: Fundamentals for Working With Flour*. USA: Purdue University.
- Hartley, R.D. dan Keene, A. S. 1984. *Aromatic Aldehyde Constituents of Graminaceous Cell Walls*. Phytochemistry, 23:1305-1307.
- Hatcher, D.W. dan Krueger, J.E. 1997. *Simple Phenolic Acids in Flours Prepared From Canadian Wheat: Relationship to Ash Content, Color, and Polyphenol Oxidase Activity*. Cereal Chemistry, 74:337-43.
- Hui, Y.H. 1992. *Encyclopedia of Food Science and Technology, vol 4*. USA: John Wiley and Sons, Inc.

- Julkunen-Tiito, R. 1985. *Phenolic Constituents in the Leaves of Northern Willows: Methods for the Analysis of Certain Phenolics.* Journal Agriculture Food Chemistry, 33(2):213-217.
- Kähkönen, M. P., Hopia, A. I., Vuorela, H. J., Rauha, J. P., Pihlaja, K., Kujala, Y. S. dan Heinonen, M. 1999. *Antioxidant Activity of Plant Extracts Containing Phenolic Compounds.* Journal Agriculture Food Chemistry, 47:3954-3962.
- Kent-Jones, D.W dan Amos, A.J. 1967. *Modern Cereal Chemistry.* London : Food Trade Press Ltd.
- Ketaren, S. 1986. *Pengantar Teknologi Minyak dan Lemak Pangan.* Universitas Indonesia, Jakarta.
- Kikugawa, K., Kunugi, A., dan Kurechi, T. 1990. *Chemistry and Implications of Degradation of Phenolic Antioxidants.* Dalam B.J.F. Hudson (Ed.). *Food Antioxidant.* London: Elsevier Applied Science.
- Li, S.J., Seymour, T.A., dan Morrissey, M.T. 1997. *Isolation of a Natural Antioxidant from Shrimp Waste.* Dalam F. Shahidi (Ed.) *Natural Antioxidants: Chemistry, Health Effects, and Application.* Illinois: AOCS Press.
- Madhavi, D.L., Deshpande, S. S., dan Salunkhe, D. K. 1996. *Technological Aspects of Food Antioxidants.* Dalam Madhavi, D.L. (Ed.) *Food Antioxidants: Techonological, Toxicological, and Health Perspectives.* New York: Marcel Dekker, Inc.
- Mc Williams, M. 1997. *Foods: Experimental Perspectives.* 3rd edition. New Jersey: Prentice Hall.
- Miller, H. E. 1971. *A Simplified Method for Evaluation of Antioxidants.* Journal of American Oil Chemistry Society, 48:91.
- Miller, H. E., Rigelhof, F., Marquart, L., Prakash, A., dan Kanter, M. 2000. *Antioxidant Content of Whole Grain Breakfast Cereals, Fruits, and Vegetables.* Journal of American College of Nutrition, 19(3):312S-319S.
- Min, D.B. dan Boff, J.M. (2002). *Lipid Oxidation of Edible Oil.* Dalam C.C. Akoh dan D.B. Min (Ed.). *Food Lipids: Chemistry, Nutrition, and Biotechnology.* 2nd edition, Revised and Expanded. New York: Marcel Dekker, Inc.

- Onyeneho, S. N., dan Hettiarachchy, N. S. 1992. *Antioxidant Activity of Durum Wheat Bran*. Journal Agriculture Food Chemistry, 49:1496-1500.
- Pakpahan, R. dan Siagian, P. H., 2001. *Penggunaan Pollard sebagai Penganti Jagung dalam Ransum dan Pengaruhnya terhadap Penampilan Sus scrofa*. Dalam F.G. Winarno, W. Lukito, Abduracchim, M. M. Ardana, B. Wijaya (Ed.) Kumpulan Hasil Penelitian Terbaik Bogasari Nugraha 1998-2001. Jakarta: PR & Communication Dept. PT. ISM Bogasari Flour Mills.
- Pasquel, L.J.R dan Babbitt, J.K. 1991. *Isolation and Partial Characterization of Natural Antioxidant from Shrimp (Pandalus jordani)*. Journal of Food Science 56(1):143-145. Dalam Almeida-Doria, R.F. dan Regitano-D'arce, A.B., 2000. *Antioxidant Activity of Rosemary and Oregano Ethanol Extracts in Soybean Oil Under Thermal Oxidation*. Ciência e Tecnologia de Alimentos Vol. 20 No. 2.
- Patrick, E., Juberg, D.R., O'Donoghue, J., dan Maibach, H.I. 1999. *Depigmentation with Tert-Butyl Hidroquinone Using Black Guinea Pigs*. Journal Food Chemical Toxicology 37(2-3):169-75.
- Pokorny, J. 1999. *Antioxidants in Food Preservation*. Dalam S. Rahman (Ed.) *Handbook of Food Preservation*. 309-334. Switzerland: Marcel Dekker, Inc.
- Pomeranz, Y. 1991. *Functional Properties of Food Components*. Second Edition. San Diego: Academic Press, Inc.
- Pomeranz, Y. dan Shellenberger, J.A. 1971. *Bread Science and Technology*. Westport-Connecticut : The AVI Publishing Company, Inc.
- Price, K. dan Martin, S. 2000. *Whole Grains and Chronic Disease: A Self-Study Guide For Health Professionals*. Minneapolis: General Mills, Inc.
- Pszczola, D. E. 2001. *Antioxidant: From Preserving Quality Food to Quality of Life*. Food Technology, 55(6):51-59.
- Schuler, P. 1990. Natural Antioxidants Exploited Commercially. Dalam B.J.F. Hudson (Ed.). *Food Antioxidant*. London: Elsevier Applied Science.
- Shahidi, F. 1997. *Natural Antioxidants: An Overview*. Dalam F. Shahidi (Ed.) *Natural Antioxidants: Chemistry, Health Effects, and Applications*. Illinois: AOCS Press.

- Slavin, J. L., Martini, M. C., Jacobs Jr., D. R., dan Marquart, L. 1999. *Plausible Mechanisms For The protectiveness of Whole Grains*. Journal Clinical Nutrition, 70: 459S-63S.
- Tranggono, 1990. *Antioksidan*. Dalam M. Astuti, Haryadi, A. Murdati, S. Naruki, K. Rahayu, S. Sudarmadji, Suparmo, Sutardi, Tranggono, *Bahan Tambahan Pangan (Food Additives)*. Yogyakarta: PAU Pangan dan Gizi Universitas Gajah Mada.
- White, P.J. dan Xing, Y. 1997. *Antioxidants from Cereals and Legumes*. Dalam F. Shahidi (Ed.) *Natural Antioxidants: Chemistry, Health Effects, and Applications*. Illinois: AOCS Press.
- Whitesides, R. E. 1995. *Home Storage of Wheat*. Utah: Utah State University Extension Publication.
- Wiyono, T.N. 1980. *Budidaya Tanaman Gandum*. Jakarta : Karya Nusantara.
- Yanishlieva-Maslarova, N.V. 2001. *Inhibiting Oxidation*. Dalam J. Pokorny, N. Yanishlieva, M.Gordon (Ed.) *Antioxidants in Food: Practical Applications*. England: Woodhead Publishing Ltd and CRC Press LLC.