

REFERENCES

- Ahn, D.U., Jo, C., Du, M., Olson, D.G. and Nam, K.C. 2000. Quality characteristics of pork patties irradiated and stored in different packaging and storage conditions. *Meat Science*. 56(2), 203-209.
- Ali, B.H., Wabel, N.A. and Blunden, G. 2005. Phytochemical, pharmacological and toxicological aspects of *Hibiscus sabdariffa* L.: a review. *Phytotherapy Research*. 19(5), 369-375.
- AOAC. 2000. Official methods of analysis of the association of official analytical chemists. 17th ed. Association of Official Analytical Chemistry, Washington, DC.
- Arabbi, P.R., Genovese, M.I. and Lajolo, F.M. 2004. Flavonoids in vegetable foods commonly consumed in Brazil and estimated ingestion by the Brazilian population. *Journal of Agricultural and Food Chemistry*. 52(5), 1124-1131.
- Asafi, N., 2004. Degradation kinetics of anthocyanins from sour cherry, pomegranate juices and their concentrate. The Joint Agriculture and Natural Resource Symposium, Tabriz-Ganja, May 14-16.
- Arts, M.J.T.J., Dallinga, J.S., Voss, H.P., Haenen, G.R.M.M. and Bast, A. 2003. A critical appraisal of the use of the antioxidant capacity (TEAC) assay in defining optimal antioxidant structures. *Food Chemistry*. 80(3), 409-414.
- Aurelio, D.L., Edgardo, R.G., and Navarro-Galindo, S. 2008. Thermal kinetic degradation of anthocyanins in a roselle (*Hibiscus sabdariffa* L. cv. 'Criollo') infusion. *International Journal of Food Science and Technology*, 43(2), 322-325.
- Bae, M.S. and Lee, S.C. 2010. Effect of deep sea water on the antioxidant activity and catechin content of green tea. *Journal of Medicinal Plants Research*. 4(16), 1662-1667.
- Bagchi, D., Sen, C.K., Bagchi, M. and Atalay, M. 2004. Anti-angiogenic, antioxidant, and anti-carcinogenic properties of a novel anthocyanin-rich berry extract formula. *Biochemistry (Moscow)*. 69(1), 75-80.
- Beckman, J.S., Chen, J., Ischiropoulos, H. and Crow, J.P. 1994. Oxidative chemistry of peroxynitrite. *Methods in Enzymology*. 233, 229-240.
- Bridle, P. and Timberlake, C.F. 1997. Anthocyanins as natural food colours - selected aspects. *Food Chemistry*. 58(1-2), 103-109.

- Brunold, C., Deters, A., Sidler, F.K., Hafner, J., Müller, B. and Hensel, A. 2004. Polysaccharides from *Hibiscus sabdariffa* flowers stimulate proliferation and differentiation of human keratinocytes. *Planta Medica*. 70(4), 370-373
- Boulton, R. 2001. The copigmentation of anthocyanins and its role in the color of red wine: a critical review. *American Journal of Enology and Viticulture*. 52(2), 67-87.
- Bourne, M. 2002. Food Texture and Viscosity - Concept and Measurement. 2nd. Academic Press, New York. 416 pp.
- Bozkurt, H. and Bayram, M. 2006. Color and textural attributes of sucuk during ripening. *Meat Science*. 73(2), 344-350.
- Bozkurt, H. and Belibagli, K.B. 2009. Use of rosemary and *Hibiscus sabdariffa* in production of kavurma, a cooked meat product. *Journal of the Science of Food and Agriculture*. 89(7), 1168-1173.
- Carlsen, C.U., Møller, J.K.S. and Skibsted, L.H. 2005. Heme-iron in lipid oxidation. *Coordination Chemistry Reviews*. 249(3-4), 485-498.
- Cassens, R.G. 1997. Residual nitrite in cured meat. *Food Technology*. 51, 53-55.
- Chambers, E. and Wolf, M.B. 1996. Sensory Testing Methods, ASTM Committee E-18 on Sensory Evaluation of Materials and Products. American Society for Testing and Materials (ASTM) International, 2nd ed. Conshohocken, PA. 115 p.
- Chan, K.M. and Decker, E.A. 1994. Endogenous skeletal muscle antioxidants. *Critical Reviews in Food Science and Nutrition*. 34(4), 403-426.
- Chang, Y.C., Huang, H.P., Hsu, J.D., Yang, S.F. and Wang, C.J. 2005. *Hibiscus* anthocyanins rich extract-induced apoptotic cell death in human promyelocytic leukaemia cells. *Toxicology and Applied Pharmacology*. 205(3), 201-212.
- Chang, Y.C., Huang, K.X., Huang, A.C., Ho, Y.C. and Wang, C.J. 2006a. *Hibiscus* anthocyanins rich extract induced apoptotic cell death in human promyelocytic leukemia cells. *Food and Chemical Toxicology*. 44(7), 1015-1023
- Chang, C.H., Lin, H.Y., Chang, C.Y. and Liu, Y.C. 2006b. Comparisons on the antioxidant properties of fresh, freeze-dried and hot-air-dried tomatoes. *Journal of Food Engineering*. 77(3), 478-485.
- Chaudhry, Q., Scotter, M., Blackburn, J., Ross, B., Boxall, A., Castle, L., Aitken, R. and Watkins, R. 2008. Applications and implications of nanotechnologies for the food sector. *Food Additives and Contaminants* 25(3), 241-258.

- Chaudhry, Q., Castle, L. and Watkins, R. 2010. Nanotechnologies in Food. Royal Society of Chemistry Publishers, Cambridge, UK. 229 p.
- Chen, L., Remondetto, G.E. and Subirade, M. 2006. Food protein-based materials as nutraceutical delivery systems. *Trends in Food Science and Technology*. 17(5), 272-283.
- Choi, S.Y., Kim, H.S., Lee, S.J., Shon, M.Y., Shin, J.H. and Sung, N.J. 2006. Effect of garlic (*Allium sativum* L.) extracts on formation of N-nitrosodimethylamine. *Journal of the Korean Society of Food Science and Nutrition*. 35(6), 677-682.
- Choi, D.B., Cho, K.A., Na, M.S., Choi, H.S., Kim, Y.O., Lim, D.H., Cho, S.J. and Cho, H. 2008. Effect of bamboo oil on antioxidative activity and nitrite scavenging activity. *Journal of Industrial and Engineering Chemistry*. 14(6), 765-770.
- Clifford, M.N. 2000. Review anthocyanins – nature, occurrence and dietary burden. *Journal of the Science of Food and Agriculture*. 80(7), 1063-1072.
- Cortinas, L., Barroeta, A., Villaverde, C., Galobart, J., Guardiola, F. and Baucells, M.D. 2005. Influence of the dietary polyunsaturation level on chicken meat quality: lipid oxidation. *Poultry Science*. 84(1), 48-55.
- Dao, L.T., Takeoka, G.R., Edwards, R.H. and Berrios, J.D.J. 1998. Improved method for the stabilization of anthocyanidins. *Journal of Agricultural and Food Chemistry*. 46(9), 3564-3569.
- Davis, K.L., Martin, E., Turko, I.V. and Murad, F. 2001. Novel effects of nitric oxide. *Annual Review of Pharmacology and Toxicology*. 41, 203-236.
- Dawson, R.M.C., Elliott, D.C., Elliott, W.H. and Jones, K.M. 2003. Data for Biochemical Research. Oxford University Press. New York. 584 p.
- Delgado-Vargas, F. and Paredes-López, O. 2003. Natural Colorants for Food and Nutraceutical Uses. CRC Press, Boca Raton, Florida. 344 p.
- den Hartog, G.J.M., Boots, A.W., Adam-Perrot, A., Brouns, F., Verkooijen, I.W.C.M., Weseler, A.R., Haenen, G.R.M.M. and Bast, A. 2010. Erythritol is a sweet antioxidant. *Journal of Nutrition*. 26(4), 449-458.
- Duhard, V., Garnier, J.C. and Megard, D. 1997. Comparison of the stability of selected anthocyanins colorants in drink model systems. *Agro Food Industry Hi-Tech*, 8(1), 28-34.
- Durst, R.W. and Wrolstad, R.E. 2001. UNIT F1.3 Separation and Characterization of Anthocyanins by HPLC. In: *Current Protocols in Food Analytical Chemistry*. Wrolstad,

- R.E., Acree, T.E., An, H., Decker, E.A., Penner, M.H., Reid, D.S., Schwartz, S.J., Shoemaker, C.F. and Sporns, P. eds. John Wiley and Sons, Inc. New York. F1.3.1-F1.3.13.
- Falcão, L.D., Falcão, A.P., Gris, E.F. and Bordignon-Luiz, M.T. 2008. Spectrophotometric study of the stability of anthocyanins from Cabernet Sauvignon grape skins in a model system. *Brazilian Journal of Food Technology*. 11(1), 63-69.
- Farombi, E.O. and Fakoya, A. 2005. Free radical scavenging and antigenotoxic activities of natural phenolic compounds in dried flowers of *Hibiscus sabdariffa* L.. *Molecular Nutrition and Food Research*. 49(12), 1120-1128.
- Fernández, J., Pérez-Álvarez, J.A. and Fernández-López, J.A. 1997. Thiobarbituric acid test for monitoring lipid oxidation in meat. *Food Chemistry*. 59(3), 345-353.
- Ferrari, C.K.B. and Torres, E.A.F.S. 2002. Lipid Oxidation and Quality Parameters of Sausages Marketed Locally in the Town of São Paulo (Brazil). *Czech Journal of Food Sciences*. 20(4), 144-150.
- Franke, A.A., Custer, L.J., Arakaki, C. and Murphy, S.P. 2004. Vitamin C and flavonoid levels of fruits and vegetables consumed in Hawaii. *Journal of Food Composition and Analysis*. 17(1), 1-35.
- FAO. 2010. International Conference on Food and Agriculture Applications of Nanotechnologies. June 20-25, Sao Pedro, SP, Brazil.
- Gandemer, G. 2002. Lipids in muscles and adipose tissues, changes during processing and sensory properties of meat products. *Meat Science*. 62(3), 309-321.
- García, M., Díaz, R., Puerta, F., Beldarraín, T., González, J. and González, I. 2010. Influence of chitosan addition on quality properties of vacuum-packaged pork sausages. *Ciência e Tecnologia de Alimentos*. 30(2), 560-564.
- Garzón, G.A. and Wrolstad, R.E. 2002. Comparison of the stability of pelargonidin-based anthocyanins in strawberry juice and concentrate. *Journal of Food Science*. 67(4), 1288-1299.
- Gauche, C., Malagoli, E.d.S. and Luiz, M.T.B. 2010. Effect of pH on the copigmentation of anthocyanins from Cabernet Sauvignon grape extracts with organic acids. *Scientia Agricola (Piracicaba Brazil)*. 67(1), 41-46.

- Giusti, M.M., Rodriguez-Saona, L.E. and Wrolstad, R.E. 1999. Molar absorptivity and color characteristics of acylated and non-acylated pelargonidin-based anthocyanins. *Journal of Agricultural and Food Chemistry*. 47(11), 4631-4637.
- Giusti, M.M. and Wrolstad, R.E. 2001. UNIT F1.2 Characterization and Measurement of Anthocyanins by UV-Visible Spectroscopy. In: *Current Protocols in Food Analytical Chemistry*. Wrolstad, R.E., Acree, T.E., An, H., Decker, E.A., Penner, M.H., Reid, D.S., Schwartz, S.J., Shoemaker, C.F. and Sporns, P. eds. John Wiley and Sons, Inc. New York. F1.2.1-F1.2.13.
- Giusti, M.M. and Wrolstad, R.E. 2003. Acylated anthocyanins from edible sources and their applications in food systems. *Biochemical Engineering Journal*. 14(3), 217-225.
- Goldstein, S. and Czapski, G. 1995. The reaction of NO^\bullet with $O_2^{\bullet-}$ and $HO_2^{\bullet-}$: a pulse radiolysis study. *Free Radical Biology and Medicine*. 19(4), 505-510.
- Goldstein, S., Czapski, G., Lind, J. and Merenyi, G. 2000. Tyrosine nitration by simultaneous generation of NO^\bullet and $O_2^{\bullet-}$ under physiological conditions *The Journal of Biological Chemistry*. 275(5), 3031-3036.
- Govindarajan, R., Rastogi, S., Vijayakumar, M., Rawat, A.K.S., Shirwaikar, A., Mehrotra, S. and Pushpangadan, P. 2003. Studies on the antioxidant activities of *Desmodium gangeticum*. *Biological and Pharmaceutical Bulletin*. 26(10), 1424-1427.
- Gray, J.I., Gomaa, E.A. and Buckley, D.J. 1996. Oxidative quality and shelf life of meats. *Meat Science*. 43(Supplement 1), 111-123.
- Halliwell, B. and Gutteridge, J.M.C. 1999. *Free Radicals in Biology and Medicine*. Oxford University Press, USA. 980 p.
- Halliwell, B. 1997. What nitrates tyrosine? Is nitrotyrosine specific as a biomarker of peroxynitrite formation in vivo?. *FEBS Letters*. 411(2-3), 157-160.
- Harnly, J.M., Doherty, R.F., Beecher, G.R., Holden, J.M., Haytowitz, D.B., Bhagwat, S. and Gebhardt, S. 2006. Flavonoid content of U.S. fruits, vegetables, and nuts. *Journal of Agricultural and Food Chemistry*. 54(26), 9966-9977.
- Hazen, S.L., Hsu, F.F. and Heinecke, J.W. 1996. *p*-Hydroxyphenylacetaldehyde is the major product of L-tyrosine oxidation by activated human phagocytes. *The Journal of Biological Chemistry*. 271(4), 1861-1867.

- Heinz, G. and Hautzinger, P. 2007. Meat processing technology: for small- to medium scale producers. Food and Agriculture Organization of the United Nations (FAO), Regional Office for Asia and the Pacific (RAP), Bangkok. Thailand. 450 p.
- Herrero, A.M., Ordóñez, J.A., Avila, R.d., Herranz, B., de la Hoz, L. and Cambero, M.I. 2007. Breaking strength of dry fermented sausages and their correlation with texture profile analysis (TPA) and physico-chemical characteristics. *Meat Science*. 77(3), 331-338.
- Hong, V. and Wrolstad, R.E. 1990. Use of HPLC separation/photodiode array detection for characterization of anthocyanins. *Journal of Agricultural and Food Chemistry*. 38(3), 708-715.
- Horbowicz, M., Kosson, R., Grzesiuk, A. and Dębski, H. 2008. Anthocyanins of fruits and vegetables - their occurrence, analysis and role in human nutrition. *Vegetable Crops Research Bulletin*. 68, 5-22.
- Howell, N.K., Herman, H. and Li-Chan E.C.Y. 2001. Elucidation of protein-lipid interactions in lysozyme-corn oil system by fourier transform raman spectroscopy. *Journal of Agricultural and Food Chemistry*. 49(3), 1529-1533.
- Hou, D.X. 2003. Potential mechanisms of cancer chemoprevention by anthocyanins. *Current Molecular Medicine*. 3(2), 149-159.
- Hou, D.X., Tong, X., Terahara, N., Luo, D. and Fujii, M. 2005. Delphinidin 3-sambubioside (Dp3-Sam), a *Hibiscus* anthocyanin, induces apoptosis in human leukemia cells through reactive oxygen species mediated mitochondrial pathway. *Archives of Biochemistry and Biophysics*. 440(1), 101-109.
- Huang, S.W. and Frankel, E.N. 1997. Antioxidant activity of tea catechins in different lipid systems. *Journal of Agricultural and Food Chemistry* . 45(8), 3033-3038.
- Huidobro, F.R., Miguel, E., Bla'zquez, B. and Onega, E. 2005. A comparison between two methods (Warner–Bratzler and texture profile analysis) for testing either raw meat or cooked meat. *Meat Science*. 69(3), 527-536.
- Ismail, A. and Yee, C. 2006. Antioxidative effects of extracts of cocoa shell, roselle seeds and a combination of both extracts on the susceptibility of cooked beef to lipid oxidation. *Journal of Food Technology*. 4(1), 10-15.
- Jayathilakan K, Sharma G.K., Radhakrishna, K. and Bawa, A.S. 2007. Antioxidant potential of synthetic and natural antioxidants and its effect on warmed-over-flavour in different species of meat. *Food Chemistry*. 105(3), 908-916.

- Jo, C., Jin, S.K. and Ahn, D.U. 2000. Color changes in irradiated cooked pork sausage with different fat sources and packaging during storage. *Meat Science*. 55(1), 107-113.
- Joshi, H. and Parle, M. 2006. Nootropic activity of calyces of *Hibiscus sabdariffa*. *Iranian Journal of Pharmacology and Therapeutics*. 5(1), 15-20.
- Jourd'heuil, D., Jourd'heuil, F.L., Kutchukian, P.S., Musah, R.A., Wink, D.A. and Grisham, M.B. 2001. Reaction of superoxide and nitric oxide with peroxynitrite. *The Journal of Biological Chemistry*. 276(31), 28799-28805.
- Kähkönen, M.P. and Heinonen, M. 2003. Antioxidant activity of anthocyanins and their aglycons. *Journal of Agricultural and Food Chemistry*. 51(3):628-633.
- Kang, H.J., Chawla, S.P., Jo, C., Kwon, J.H. and Byun, M.W. 2006. Studies on the development of functional powder from citrus peel. *Bioresource Technology*. 97(4), 614-620.
- Kanner, J. 1994. Oxidative processes in meat and meat products: quality implications. *Meat Science*. 36(1-2), 169-189.
- Karabacaka, S. and Bozkurt, H. 2008. Effects of *Urtica dioica* and *Hibiscus sabdariffa* on the quality and safety of sucuk (Turkish dry-fermented sausage). *Meat Science*. 78(3), 288-296.
- Kay, C.D. and Holub, B.J. 2002. The effect of wild blueberry (*Vaccinium angustifolium*) consumption on postprandial serum antioxidant status in human subjects. *British Journal of Nutrition*. 88(4):389-398.
- Keeton, J.T., Osburn, W.N., Hardin, M.D., Bryan, N.S. and Longnecker, M.T. 2009. A national survey of the nitrite/nitrate concentrations in cured meat products and non-meat foods available at retail. Executive Summary. National Pork Board Project #08-124, 78 p.
- Kilic, B., Cassens, R.G. and Borchert, L.L. 2001. Influence of turkey meat on residual nitrite in cured meat products. *Journal of Food Protection*. 64(2), 235-239.
- Kilic, B., Cassens, R.G. and Borchert, L.L. 2002. Effect of turkey meat, phosphate, sodium lactate, carrageenan, and konjac on residual nitrite in cured meats. *Journal of Food Science*. 67(1), 29-31.
- Kim, J.S. and Lee, Y.S. 2010. Characteristics and antioxidant activity of maillard reaction products from fructose-glycine oligomer. *Food Science and Biotechnology*. 19(4), 929-940.

- Kingston, E.R., Monahan, F.J., Buckley, D.J. and Lynch, P.B. 1998. Lipid oxidation in cooked pork as affected by vitamin E, cooking and storage conditions. *Journal of Food Science*. 63(3), 386-389.
- Kırca, A., Özkan, M. and Cemeroğlu, B. 2007. Effects of temperature, solid content and pH on the stability of black carrot anthocyanins. *Food Chemistry*. 101(1), 2007, Pages 212-218
- Kong, J.M., Chia, L.S., Goh, N.K., Chia, T.F. and Brouillard, R. 2003. Analysis and biological activities of anthocyanins. *Phytochemistry*. 64(5), 923-933.
- Kopjar, M., Tiban, N.N., Pilizota, V. and Babic, J. 2009. Stability of anthocyanins, phenols and free radical scavenging activity through sugar addition during frozen storage of blackberries. *Journal of Food Processing and Preservation*. 33(Supplement1), 1-11.
- Krifi, B., Chouteau, F., Boudrant, J. and Metche, M. 2000. Degradation of anthocyanins from blood orange juices. *International Journal of Food Science and Technology*. 35(3), 275-283
- Küçük, M., Kolaylı, S., Karaoğlu, S., Ulusoy, E., Baltacı, C. and Candan, F. 2007. Biological activities and chemical composition of three honeys of different types from Anatolia. *Food Chemistry*. 100(2), 526-534.
- Lin, K.W. and Chao, J.Y. 2001. Quality characteristics of reduced-fat Chinese-style sausage as related to chitosan's molecular weight. *Meat Science*. 59(4), 343-351.
- Linares, E., Giorgio, S., Mortara, R.A., Santos, C.X.C., Yamada, A.T. and Augusto, O. 2001. Role of peroxynitrite in macrophage microbicidal mechanisms in vivo revealed by protein nitration and hydroxylation. *Free Radical Biology and Medicine*. 30(11), 1234-1242.
- Linse, S., Cabaleiro-Lajo, C., Xue, W.F., Lynch, I., Lindman, S., Thulin, E., Radford, S. and Dawson, K. 2007. Nucleation of proteins fibrillation by nanoparticles. *Proceedings of the National Academy of Sciences of the United States of America*. 104(21), 8691-8696.
- Liu, D.C., Wu, S.W., and Tan, F.J. 2010. Effects of addition of anka rice on the qualities of low-nitrite Chinese sausages. *Food Chemistry*. 118(2), 245-250.
- Lombardi-Boccia, G., Martinez-Dominguez, B. and Aguzzi, A. 2002. Total heme and non-heme Iron in raw and cooked meats. *Journal of Food Science*. 67(5), 1738-1741.
- Malien-Aubert, A., Dangles, O. and Amiot, J. 2001. Color stability of commercial anthocyanin-based extracts in relation to the phenolic composition. Protective effects by intra-and

- intermolecular copigmentation. *Journal of Agricultural and Food Chemistry*. 49(1), 170-176.
- Maguire, A. 2006. Dental Health In: *Sweeteners and Sugar Alternatives in Food Technology*. Mitchell, H. (ed). Blackwell Publishing, Ltd. Ames, Iowa. pp: 19-53.
- Manian, R., Anusuya, N., Siddhuraju, P. and Manian, S. 2008. The antioxidant activity and free radical scavenging potential of two different solvent extracts of *Camellia sinensis* (L.) O. Kuntz, *Ficus bengalensis* L. and *Ficus racemosa* L. *Food Chemistry*. 107(3), 1000-1007.
- Middleton, E.Jr., Kandaswami, C. and Theoharides, T.C. 2000. The effects of plant flavonoids on mammalian cells: implications for inflammation, heart disease, and cancer. *Pharmacological Reviews*. 52(4), 673-751.
- Min, D.B., Chen, M.H. and Green, B.W. 2009. Antioxidant activities of purple rice bran extract and its effect on the quality of low-NaCl, phosphate-free patties made from channel catfish (*Ictalurus punctatus*) belly flap meat. *Journal of Food Science*. 74(3), C268-C277.
- Monahan, F.J. 2000 Oxidation of Lipids in Muscle Foods: Fundamental and Applied Concerns In: *Antioxidants in Muscle Foods Nutritional Strategies to Improve Quality*. Decker, E.A., Faustman, C. and Lopez-Bote, C.J. (eds.). John Wiley and Sons, Inc. New York. pp: 3-24.
- Morris, V. 2007. Nanotechnology and food. The International Union of Food Science and Technology (IUFoST). Accessed 2010 January. Available at: http://www.iufost.org/reports_resources/bulletins/documents/IUF.SIB.Nanotechnology.pdf
- Morrissey, P.A., Sheehy, P.J.A., Galvin, K., Kerry, J.P. and Buckley, D.J. 1998. Lipid stability in meat and meat products. *Meat Science*. 49(Supplement 1), S73-S86.
- Mounnissamy, V.M., Kavimani, S. and Gunasegaran, R. 2002. Antibacterial activity of gossypetin isolated from *Hibiscus sabdariffa*. *The Antiseptic*. 99(3), 81-82
- Muselik, J., García-Alonso, M., Martín-López, M.P., Žemlička, M. and Rivas-Gonzalo, J.C. 2007. Measurement of antioxidant activity of wine catechins, procyanidins, anthocyanins and pyranoanthocyanins. *International Journal of Molecular Sciences*. 8(8), 797-809.
- Narayan, M.S., Naidu, K.A., Ravishankar, G.A., Srinivas, L. and Venkataraman, L.V. 1999. Antioxidant effect of anthocyanin on enzymatic and non-enzymatic lipid peroxidation. Prostaglandins. Leukotrienes and Essential Fatty Acids. 60(1), 1-4.

- Natella, F., Belevi, F., Gentili, V., Ursini, F. and Scaccini, C. 2002. Grape seed proanthocyanidins prevent plasma postprandial oxidative stress in humans. *Journal of Agricultural and Food Chemistry*. 50(26), 7720-7725.
- Naveena. B.M., Sen, A.R., Kingsly, R.P., Singh, D.B. and Kondaiah, N. 2008. Antioxidant activity of pomegranate rind powder extract in cooked chicken patties. *International Journal of Food Science and Technology*. 43(10), 1807-1812.
- Nickols-Richardson, S.M. 2007. Nanotechnology: implications for food and nutrition professionals. *Journal of the American Dietetic Association*. 107(9), 1494-1497.
- Nunez de Gonzalez, M.T., Hafley, B.S., Boleman, R.M., Miller, R.K., Rhee, K.S. and Keeton, J.T. 2008. Antioxidant properties of plum concentrates and powder in precooked roast beef to reduce lipid oxidation. *Meat Science*. 80(1), 997-1004.
- Østerlie, M. and Lerfall, J. 2005. Lycopene from tomato products added minced meat. Effect on storage quality and colour. *Food Research International*. 38(8-9), 925-929.
- Pacher, P., Beckman, J.S. and Liaudet, L. 2007. Nitric oxide and peroxynitrite in health and disease. *Physiological Reviews*. 87(1), 315-424.
- Parinyapatthanaboot, T. and Pinsirodom, P. 2010. Effect of anthocyanins from different plant source on the oxidative stability of vacuum packed Chinese-style sausage during storage (D094). 56th International Congress of Meat Science and Technology (ICoMST). Jeju International Convention Center. Jeju Island, Republic of Korea. August 15-20. (5 p. CD format)
- Pariza, M.W. 1997. Examination of dietary recommendations for salt-cured, smoked, and nitrite-preserved foods. Council for Agricultural Science and Technology (CAST), Iowa State University. Ames, IA. Issue Paper. No.8, 8 p.
- Parthasarathy, S., Khan-Merchant, N., Penumetcha, M. and Santanam, N. 2001. Oxidative stress in cardiovascular disease. *Journal of Nuclear Cardiology*. 8(3), 379-389.
- Patras, A., Brunton, N.P., O'Donnell, C. and Tiwari, B.K. 2010. Effect of thermal processing on anthocyanin stability in foods; mechanisms and kinetics of degradation. *Trends in Food Science and Technology*. 21(1), 3-11.
- Pegg, R.B. and Shahidi, F. 2000. Nitrite Curing of Meat. The N-nitrosamine problem and nitrite alternatives. Food and Nutrition Press. Inc. Connecticut. 268 p.

- Pennathur, S., Wagner, J.D., Leewenburgh, C., Liwak, K.N. and Heinecke, J.W. 2001. A hydroxyl radical-like species oxidizes cynomolgus monkey artery wall proteins in early diabetic vascular disease. *The Journal of Clinical Investigation*. 107(7), 853-860.
- Pérez-Cacho, M.P.R., Galán-Soldevilla, H., León Crespo, F. and Molina Recio, G. 2005. Determination of the sensory attributes of a Spanish dry-cured sausage. *Meat Science*. 71(4), 620-633.
- Pérez-Rodríguez, M.L., Bosch-Bosch, N. and García-Mata, M. 1996. Monitoring nitrite and nitrate residues in frankfurters during processing and storage. *Meat Science*. 44(1-2), 65-73.
- Pfeiffer, S., Schmidt, K. and Mayer, B. 2000. Dityrosine formation outcompetes tyrosine nitration at low steady-state concentrations of peroxynitrite. *The Journal of Biological Chemistry*. 275(9), 6346-6352.
- Pinotti, A., Graiver, N., Califano, A. and Zaritzky, N. 2001. Diffusion of nitrite and nitrate salts in pork tissue in the presence of sodium chloride. *Journal of Food Science*. 67(6), 2165-2171.
- Pinsirodom, P. 2008. Antioxidant Properties of Roselle (*Hibiscus sabdariffa* Linn.) Extract and Its Antioxidant Efficiency in Chinese-Style Sausage and Pork Chips as Affected by Various Types of Sugar. Report submitted for Office of the National Research Council of Thailand (NRCT), Bangkok. Thailand. 65 p. (in Thai)
- Prior, R.L. 2003. Fruits and vegetables in the prevention of cellular oxidative damage. *American Journal of Clinical Nutrition*. 78(supplement), 570S–578S.
- Prior, R.L. 2004. Absorption and metabolism of anthocyanins: potential health effects (Chapter 1): In *Phytochemicals: Mechanism of Action*. Meskin, M.S., Bidlack, W.R., Davies, A.J., Lewis, D.S. and Randolph, R.K. eds. CRC Press, Boca Raton, Florida. p. 1-19.
- Radi, R., Peluffo, G., Alvarez, M.N., Navillat, M. and Cayota, A. 2001. Unraveling peroxynitrite formation in biological systems. *Free Radical Biology and Medicine*. 30(5), 463-488.
- Raghavan, S. and Richards, M.P. 2007. Comparison of solvent and microwave extracts of cranberry press cake on the inhibition of lipid oxidation in mechanically separated turkey. *Food Chemistry*. 102(3), 818-826.
- Rahman, M.M. Ichianagi, T., Komiyama, T., Hatano, Y. and Konishi, T. 2006. Superoxide radical- and peroxynitrite-scavenging activity of anthocyanins; structure-activity relationship and their synergism. *Free Radical Research*. 40(9), 993-1002.

- Rahman, M.S., Al-Waili, H., Guizani, N. and Kasapis, S. 2007. Instrumental-sensory evaluation of texture for fish sausage and its storage stability. *Fisheries Science*. 73(5), 1166-1176.
- Rao, D.N. 1997. Intermediate moisture foods based on meats-a review. *Food Reviews International*, 13(4), 519-551.
- Rao, A.V. and Agarwal, S. 2000. Role of antioxidant lycopene in cancer and heart disease. *Journal of the American College of Nutrition*. 19(5), 563-569.
- Reanmongkol, W. and Itharat, A. 2007. Antipyretic activity of the extracts of *Hibiscus sabdariffa* calyces in experimental animals. *Songklanakarin Journal of Science and Technology*. 29(supplement 1), 29-38
- Reis, P.B., Ramos, R.M., de Souza, L.F. and de Vasconcelos Cançado, S. 2009. Validation of spectrophotometric method to detect and quantify nitrite in ham pate. *Brazilian Journal of Pharmaceutical Sciences*. 45(1), 49-55.
- Reyes, L.F., and Cisneros-Zevallos, L. 2007. Degradation kinetics and colour of anthocyanins in aqueous extracts of purple- and red-flesh potatoes (*Solanum tuberosum* L.). *Food Chemistry*, 100(3), 885-894.
- Rice-Evans, C.A., Miller, N.J. and Paganga, G. 1996. Structure-antioxidant activity relationships of flavonoids and phenolic acids. *Free Radical Biology and Medicine*. 20(7), 933-956.
- Rodriguez-Saona, L.E. and Wrolstad, R.E. 2001. UNIT F1.1 Extraction, Isolation, and Purification of Anthocyanins In: *Current Protocols in Food Analytical Chemistry*. Wrolstad, R.E., Acree, T.E., An, H., Decker, E.A., Penner, M.H., Reid, D.S., Schwartz, S.J., Shoemaker, C.F. and Sporns, P. eds. John Wiley and Sons, Inc. New York. F1.1.1-F1.1.11.
- Ross, J.A. and Kasum, C.M. 2002. Dietary flavonoids: bioavailability, metabolic effects, and safety. *Annual Review of Nutrition*. 22, 19-34.
- Saha, K., Lajis, N.H. and Israf, D.A. 2004. Evaluation of antioxidant and nitric oxide inhibitory activities of selected Malaysian medicinal plants. *Journal of Ethnopharmacology*. 92(2-3), 263-267.
- Salata, O.V. 2004. Applications of nanoparticles in biology and medicine. *Journal of Nanobiotechnology*. 2(3). Accessed 2010 January. Available at: <http://www.jnanobiotechnology.com/content/2/1/3>

- Samelis, J., Metaxopoulos, J., Vlassi, M. and Pappa, A. 1998. Stability and safety of traditional Greek salami - A microbiological ecology study. *International Journal of Food Microbiology*. 44(1-2), 69-82.
- Sanz, Y., Vila, R., Toldrá, F., Nieto, P. and Flores, J. 1997. Effect of nitrate and nitrite curing salts on microbial changes and sensory quality of rapid ripened sausages. *International Journal of Food Microbiology*. 37(2-3), 225-229.
- Sanz, Y., Vila, R., Toldrá, F. and Flores, J. 1998. Effect of nitrate and nitrite curing salts on microbial changes and sensory quality of non-fermented sausages. *International Journal of Food Microbiology*. 42(3), 213-217.
- Sasaki, K., Mitumoto, M. and Kawabata, K. 2001. Relationship between lipid peroxidation and fat content in Japanese Black beef *Longissimus* muscle during storage. *Meat Science*. 59(4), 407-410.
- Sebranek, G.J. and Fox, B.J. 1985. A review of nitrite and chloride chemistry: Interactions and implications for cured meats. *Journal of the Science of Food and Agriculture*. 36(11), 1169-1182.
- Sebranek, J.G., Sewalt, V.J.H., Robbins, K.L. and Houser, T.A. 2005. Comparison of a natural rosemary extract and BHA/BHT for relative antioxidant effectiveness in pork sausage. *Meat Science*. 69(2), 289-296.
- Sebranek, J.G. and Bacus, J.N. 2007. Cured meat products without direct addition of nitrate or nitrite: what are the issues?. *Meat Science*. 77(1), 136-147.
- Seeram, N.P. and Nair, M.G. 2002. Inhibition of lipid peroxidation and structure-activity-related studies of the dietary constituents anthocyanins, anthocyanidins, and catechins. *Journal of Agricultural and Food Chemistry*. 50(19):5308-5312.
- Shivali, M.N. and Kamboj, P. 2009. *Hibiscus sabdariffa* Linn. - An overview. *Natural Product Radiance*. 8(1), 77-83.
- Squadrito, G.L. and Pryor, W.A. 1998. Oxidative chemistry of nitric oxide: the roles of superoxide, peroxynitrite, and carbon dioxide. *Free Radical Biology and Medicine*. 25(4-5), 392-403.
- Socaciu, C. 2008. Natural Pigments as Food Colorants In: *Food Colorants: Chemical and Functional Properties*. Socaciu, C. ed. CRC Press, Boca Raton. pp: 583-602.
- Sozer, N. and Kokini, J.L. 2009. Nanotechnology and its applications in the food sector. *Trends in Biotechnology*. 27(2), 82-89.

- Stadtman, E.R. 2001. Protein oxidation in aging and age-related diseases. *Annals of the New York Academy of Sciences*. 928(1), 22-38.
- Sun, Y.M., Ockerman, H.W. and Marriott, N.G. 2000. Garlic in Chinese sausage. *Journal of Muscle Foods*. 11(1), 35-43.
- Swetwathana, A., Lotong, N., Nakayama, J. and Sonomoto, K. 2007. Maturation of Nham – a Thai fermented meat product: effect of Pediocin PA-1 producer (*Pediococcus pentosaceus* TISTR 536) as starter culture, nitrite and garlic on *Salmonella anatum* during Nham fermentation. *Fleisch Wirtschaft International*. 22(3), 46-49.
- Tan, F.J., Hsu, K.C. and Ockerman, H.W. 2006. Effect of ripening temperature on quality characteristics of Chinese-style sausages. *Journal of Muscle Foods*. 17(4), 367-374.
- Thai Industrial Standards Institute (TISI). 2003. Standard of Thai industrial standards institute: Chinese style sausage: Pork. TISI 103-2003. Ministry of Industry, Thailand. (in Thai)
- Thai Industrial Standards Institute (TISI). 2004. Standard of Thai industrial standards institute: Naem (Fermented Ground Pork). TISI 1219-2004. Ministry of Industry, Thailand. (in Thai)
- Thai Industrial Standards Institute (TISI). 2006. Standard of Thai industrial standards institute: Vienna sausages. TISI 3540-2006. Ministry of Industry, Thailand. (in Thai)
- Tinsley, I.J. and Bockian, A.H. 1959. Some effects of sugars on the breakdown of pelargonidin-3-glucoside in model system at 90 °C. *Journal of Food Science*. 25(2), 161-173.
- Tsai, P.J., McIntosh, J., Pearce, P., Camden, B. and Jordan, B.R. 2002. Anthocyanin and antioxidant capacity in Roselle (*Hibiscus Sabdariffa* L.) extract. *Food Research International*. 35(4), 351-356.
- Tsai, P.J. and Huang, H.P. 2004. Effect of polymerization on the antioxidant capacity of anthocyanins in Roselle. *Food Research International*. 37(4), 313-318.
- Tsai, P.J., Hsieh, Y.Y. and Huang, T.C. 2004. Effect of sugar on anthocyanin degradation and water mobility in a roselle anthocyanin model system using ¹⁷O NMR. *Journal of Agricultural and Food Chemistry*. 52(10), 3097–3099.
- Tsai, P.J., Delva, L., Yu, T.Y., Huang, Y.T. and Dufossé, L. 2005. Effect of sucrose on the anthocyanin and antioxidant capacity of mulberry extract during high temperature heating. *Food Research International*. 38(8-9), 1059-1065.

- Tsai, P.J., Chen, Y.S., Sheu, C.H. and Chen, C.Y. 2011. Effect of nanogrinding on the pigment and bioactivity of Djulis (*Chenopodium formosanum* Koidz.). *Journal of Agricultural and Food Chemistry*. 59(5), 1814-1820.
- Tseng, T.H., Hsu, J.D., Lo, M.H., Chu, C.Y., Chou, F.P., Huang, C.L. and Wang, C.J. 1998. Inhibitory effect of Hibiscus protocatechuic acid on tumor promotion in mouse skin. *Cancer Letters*. 126(2), 199-207.
- Tseng, K.C., Chang, H.M. and Wu, J.S.B. 2006. Degradation kinetics of anthocyanin in ethanolic solutions. *Journal of Food Processing and Preservation*. 30(5), 503-514.
- Tsuda, T., Kato, Y. and Osawa, T. 2000. Mechanism for the peroxynitrite scavenging activity by anthocyanins. *Federation of European Biochemical Societies Letters*. 484(3), 207-210.
- Uppu, R.M., Squadrito, G.L. and Pryor, W.A. 1996. Acceleration of peroxynitrite oxidations by carbon dioxide. *Archives of Biochemistry and Biophysics*. 327(2), 335-343.
- Üren, A. and Babayiğit, D. 1997. Color parameters of Turkish-type fermented sausage during fermentation and ripening. *Meat Science*. 45(4), 539-549.
- van Dalen, C.J., Winterbourn, C.C., Senthilmohan, R. and Kettle, A.J. 2000. Nitrite as a substrate and inhibitor of myeloperoxidase. Implications for nitration and hypochlorous acid production at sites of inflammation. *The Journal of Biological Chemistry*. 275(16), 11638-11644.
- Viljanen, K., Kylli, P., Hubbermann, E.-M., Schwartz, K. and Heinonen, M. 2005. Anthocyanin antioxidant activity and partitioning behavior in whey proteins. *Journal of Agricultural and Food Chemistry*. 53(6), 2022-2027.
- Viljanen, K., Kylli, P., Kivikari, R. and Heinonen, M. 2004. Inhibition of protein and lipid oxidation in liposomes by berry phenolics. *Journal of Agricultural and Food Chemistry*. 52(24), 7419-7424.
- Villota, R. and Hawkes, J.G. 2007. Reaction Kinetics in Food Systems In: *Handbook of Food Engineering*, Heldman, D.R. and Lund, D.B. (eds.). 2nd ed. CRC Press, Boca Raton. pp: 125-286.
- Viuda-Martos, M., Fernández-López, J., Sayas-Barbera, E., Sendra, E., Navarro, C. and Pérez-Álvarez, J.A. 2009. Citrus co-products as technological strategy to reduce residual nitrite content in meat products. *Journal of Food Science*. 74(8), R93-R100.
- Wang, H., Cao, G. and Prior, R.L. 1997. Oxygen radical absorbing capacity of anthocyanins. *Journal of Agricultural and Food Chemistry*. 45(2), 304-309.

- Wang, B. and Xiong, Y.L. 1998. Functional stability of antioxidant-washed, cryoprotectant-treated beef heart surimi during frozen storage. *Journal of Food Science*. 63(2), 293-298.
- Wang, W.D. and Xu, S.Y. 2007. Degradation kinetics of anthocyanins in blackberry juice and concentrate. *Journal of Food Engineering*. 82(3), 271-275.
- Wang, C.L., Ma, Y.Y., Chen, M.H., Wang, Y.R., Lei, S., Li, F.J. and Liu, D.W. 2010. Effect of pH on nitrite reduction of pickled Chinese cabbage. *Bioinformatics and Biomedical Engineering (iCBBE)*, 4th International Conference on 18-20 June, Chengdu. 4 p.
- Willett, W.C. 2000. Diet and cancer. *Oncologist*. 5(5), 393-404.
- Wiseman, H. and Halliwell, B. 1996. Damage to DNA by reactive oxygen and nitrogen species: role in inflammatory disease and progression to cancer. *Biochemical Journal*. 313, 17-29.
- Wong, P.K., Yusof, S., Ghazali, H.M. and Che-Man, Y.B. 2002. Physico-chemical characteristics of roselle (*Hibiscus sabdariffa* L.). *Nutrition and Food Science*, 32(2), 68-73.
- Wrolstad, R.E., Skrede, G.L., Lea, P. and Enersen, G. 1990. Influence of sugar on anthocyanin pigment stability in frozen strawberries. *Journal of Food Science*. 55(4), 1064-1065, 1072.
- Wrolstad, R.E. Durst, R.W. and Lee, J. 2005. Tracking color and pigment changes in anthocyanin products. *Trends in Food Science and Technology*. 16(9), 423-428.
- Wu, X., Beecher, G.R., Holden, J.M., Haytowitz, D.B., Gebhardt, S.E. and Prior, R.L. 2006. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *Journal of Agricultural and Food Chemistry*. 54(11), 4069-4075.
- Xiong, Y.L. 2000. Protein Oxidation and Implication for Muscle Food Quality In: *Antioxidants in Muscle Foods Nutritional Strategies to Improve Quality*. Decker, E.A., Faustman, C. and Lopez-Bote, C.J. (eds.). John Wiley and Sons, Inc. New York. pp: 85-111.
- Yilmaz, Y. and Toledo, R. 2005. Antioxidant activity of water-soluble maillard reaction products. *Food Chemistry*. 93(2), 273-278.
- Yin, J., Kwon, G.J. and Wang, M.H. 2007. The antioxidant and cytotoxic activities of *Sonchus oleraceus* L. extracts. *Nutrition Research and Practice*. 1(3), 189-194.
- Youdim, K.A., Martin, A. and Joseph, J.A. 2000. Incorporation of the elderberry anthocyanins by endothelial cells increases protection against oxidative stress. *Free Radical Biology and Medicine*. 29(1), 51-60.

- Zhang, Z., Kou, X., Fugal, K. and McLaughlin, J. 2004. Comparison of HPLC methods for determination of anthocyanins and anthocyanidins in bilberry extracts. *Journal of Agricultural and Food Chemistry*. 52(4), 688-691.
- Zheng, W. and Wang, S.Y. 2003. Oxygen radical absorbing capacity of phenolics in blueberries, cranberries, chokeberries, and lingonberries. *Journal of Agricultural and Food Chemistry*. 51(2), 502-509.