

REFERENCES

- A.O.A.C. 1990. Official Method of Analysis of the Association of Official Chemists 15th (ed) The Association of Official Analysis Chemists, Inc., Virginia.
- Ackman, R. G. 1980. Algae as a source of edible oils. *In* New Sources of fats and oils, (ed. E. H. Pryde, L. H. Princen, and K. D. Mukherjee.). p. 189-220., CRC Press, Boca Ration, Florida, USA.
- Ackman, R. G. 1982. Fatty acid compositions of fish oils. *In* Nutritional Evaluation of Long-Chain Fatty Fcids in Fish Oil (ed. Barlow, S. M., Stansby, M. E.). p. 25-88, Academic Press, New York.
- Ackman, R. G. 1988. The year of fish oils. *Chem. Industry*. March 7. 139-145.
- Ackman, R. G. 1989. Fatty acids. *In* Marine Biogenic Lipids, Fats and oils. Vol. I. (ed. Ackman, R. G.). p. 103-137, CRC Press, Inc., Boca Roton, Florida.
- Ackman, R. G. and McLachlan, J. 1979. Octadecapentaenoic acid and macrophytes. *In* Proceeding of The Sixth International Seaweed Symposium. 1977. (ed. A. Jensen and J. R. Stein.). p. 429-436, Science Press. Princeton, USA.
- Ackman, R. G., Ratnayake, W. M. N. and Olsson, B. 1988. The basic fatty acid compositions of Atlantic fish oils: Potential similarities useful for enrichment of polyunsaturated fatty acids by urea complexation. *J. Am. Oil Chem. Soc.* 65: 136-138.
- Adlercreutz, P. 1991. Immobilized emzyme. *In* Food Enzymology Vol. II (ed. Fox, P.F.). p. 103-118., Elsevier Applied Science, London.
- Akoh, C. C. 1995. Review. Lipid-based fat substitutes. *Crit. Rev. Food Sci. Nutr.* 35(5): 405-430.
- Akoh, C. C. 1996. Enzymatic modification of lipids. *In* Food Lipids and Health (ed. Mcdonald, R. E.). p. 117-134, Marcel Dekker, New York.
- Akoh, C. C. and Moussta, C. O. 1998. Lipase-catalyzed modification of borage oil: Incorporation of capric and eicosapentaenoic acids to form structured lipid. *J. Am. Oil Chem. Soc.* 75: 697-701.
- Anon. 1990. Research with traditional flaxseed. *INFORM*. 1: 944-955.

- Arcos, J. A., Garcia, H. S. and Hill, C. G. 1999. Continuous enzymatic esterification of glycerol with (poly) unsaturated fatty acids in a packed bed reactor. *Biotechnol. Bioeng.* 68: 563-570.
- Arnar, H., Bjorn, K., Caroline, G. and Haraldsson, G. G. 2003. Separation of EPA and DHA in fish oil by lipase-catalyzed esterification with glycerol. *Am. Oil Chem. Soc.* 80(9): 915-921.
- Balcao, V. M., Paiva, A. and Malcata, F. X. 1996. Bioreactor with immobilized lipases: State of art. *Enzyme Microb. Technol.* 18: 392-416.
- Bastida, A., Sabuquillo, P., Armisen, P., Lafuente, R. F., Hugute, J. and Guisan, J. M. 1998. A single step purification, immobilization and hyperactivation of lipases via interfacial adsorption on strongly hydrophobic supports. *Biotechnol. Bioeng.* 58: 486-493.
- Battino, M., Bertoli, E., Formiggini, G., Sassi, S., Gorini, R., Villa, R. F. and Lenaz, G. 1967. Structural and functional aspects of the respiratory chain of synaptic and nonsynaptic mitochondria derived from selected brain regions. *J. Bioenerg. Biomembr.* 23(2): 345-363.
- Bimbo, A. 1990. Processing of fish oils. *In Fish Oils in Nutrition.* (ed. M. E. Stansby. Van). p.181-225., Nostrand Reinhold Pub, New York.
- Bloomer, S., Adlercreutz, P. and Mattiasson, B. 1991. Triglyceride interesterification by lipases: reaction parameters for the reduction of trisaturate impurities and diglycerides in batch reactions. *Biocatalysis.* 5: 145-162.
- Bornscheuer, U. T. 1995. Lipase-catalyzed synthesis of monoacylglycerols. *Enzyme Microb. Technol.* 17: 578-586.
- Bornscheuer, U. T. 2000. *Enzymes in Lipid Modification.* (ed.) Wiley-VCH, Weinheim, German.
- Bornscheuer, U. T. and Kazlauskas, R. J. 1999. Hydrolases. *In Organic Synthesis-Regio- and Stereoselective Biotransformations*, Wiley-VCH, Weinheim, German.
- Bornscheuer, U. T. and Yamane, T. 1994. Activity and stability of lipase in the solid phase glycerolysis of triolein. *Enzyme Microb. Technol.* 16: 864-869.
- Bouwer, S. T., Cuperus, F. P. and Derksen, J. F. T. 1997. The performance of enzyme- membrane reactor with immobilized lipase. *Enzyme Microb. Technol.* 21: 291-296.

- Breivik, H. and Dahl, K. H. 1992. Production and control of *n*-3 fatty acids. *In* Fish Oil and Human Health, Clinical Pharmacology. Vol. 5 (ed. Frolich, J. C., Zuckschwerdt, V. and von Schacky, C.). p. 25-39, Munchen, German.
- Breivik, H., Haraldsson, G. G. and Kristinsson, B. 1997. The preparation of highly purified concentrates of EPA and DHA. *J. Am. Oil Chem. Soc.* 74: 1425-1429.
- Brow, T. D., Kakkar, V. V. and Das, S. K. 1999. The significance of creatine kinase in cardiac patients with acute limb ischaemia. *J. Cardiovasc. Surg.* 40(5): 637-644.
- Burdage, G. C., Jones, A. E. and Wootton, S. A. 2002. Eicosapentaenoic and docosahexaenoic acids are the principal products of α -linoenic acid metabolism in young men. *Br. J. Nutr.* 88: 355-365.
- Burdage, G. C. and Wootton, S. A. 2002. Conversion of α -linoenic acid to ecosapentaenoic, docosapentaenoic and docosahexaenoic acids in young women. *Br. J. Nutr.* 88: 411-420.
- Calabrese, E. J., Baldwin, L. A. and Holland, C. D. 1999. Hormesis: a highly generalizable and reproducible phenomenon with important implications for risk assessment. *Risk Anal.* 19 (2):261-281.
- Carrie, D., Elbaz, M., Andrieu, M., Cantie, P., Fourcade, J. and Puel, J. 2000. Ten-years clinical and angiographic follow-up of coronary walls. *Am. J. Cardiol.* 85(1): 95-98, A8.
- Carroll, G. 1986. Fungal endophytes in stems and leaves: from latent pathogen to mutualistic symbiont. *Ecology.* 69(1):2-9.
- Carta, G., Gainer, J. R. and Gibson, M. E. 1992. Synthesis of ester using a nylon-immobilized lipases in batch and continuous reactor. *Enzyme Microb. Technol.* 14:904-910.
- Castro, H. F., Oliveira, P. C., Soares, C. M. F. and Zanin, G. M. 1999. Immobilization of porcine pancreatic lipases on celite for application synthesis of butyl butyrate in nonaqueous system. *J. Am. Oil Chem. Soc.* 76: 147-152.
- Chakra, W. 2005. Synthesis of regioisomerically pure triacylglycerols containing *n*-3 very long-chain polyunsaturated fatty acids. *Eur. J. Lipid Sci. Technol.* 107: 842-832.
- Chandler, I. C., Quinlan, P. T. and McNeill, G. 1998. Lipase-catalyzed synthesis of chiral triglycerides. *J. Am. oil Chem. soc.* 75: 1513-1517.

- Chang, P. S. and Rhee, J.S. 1991. Continuous glycerolysis of olive oil by *Chromobacterium viscosum* lipase immobilized on liposome reversed micelles. *Biotechnol. Bioeng.* 38: 1159-1165.
- Chantachum, S., Benjakul, S. and Srivirat, N. 2000. Separation and quality of fish oil from precooked and non-precooked tuna heads. *Food Chem.* 69: 289-294.
- Chaplin, M. F. and Bucke, C. 1990. *Enzyme Technology*. p.80-135. Cambridge University Press, Cambridge.
- Christensen, J. H., Christensen, M. S., Dyerberg, J. and Schmidt, E. B. 1999. Heart rate variability and fatty acid content of blood cell membranes: a dose-response study with *n*-3 fatty acids. *Am. J. Clin. Nutr.* 70(3): 331-337.
- Christophe, J. 1998. Review. Is there appetite after GLP-1 and PACAP?. *Ann. N. Y. Acad. Sci.* 865: 323-335.
- Choi, K. J., Nakhost, Z., Krukonis, V. J. and Karel, M. 1987. Supercritical fluid extraction and characterization of lipids from algae *Scenedesmus obliquus*. *Food Biotechnol.* 1(2): 263-264.
- Colombie, S., Tweddell, R.J., Condoret, J-Stephane. and Mary, A. 1997. Water activity control: a way to improve efficiency of continuous lipase esterification. *Biotechnol. Bioeng.* 60: 362-368.
- Connor, R. A. 2000. Movement toward individual health benefit accounts. *Manag. Care.* 9 (11):42, 46, 49-50.
- Damstrup, M. L., Jensen, T., SparsØ, F. V., Kiil, S. Z., Jensen, A. D. and Xu, X. 2005. Solvent optimization for efficient enzymatic monoacylglycerol production based on a glycerolysis reaction. *J. Am. Oil Chem. Soc.* 82: 559-564.
- Deng, L., Xu, X., Haraldsson, G. G., Tan, T. and Wang, F. 1999. Enzymatic production of alkyl esters through alcoholysis: a critical evaluation of lipases and alcohols. *J. Am. Oil Chem. Soc.* 82: 789-792.
- Dordick, J. S. 1989. Enzymatic catalysis in monophasic organic solvents. *Enzyme Microb. Technol.* 11: 194-211.
- Dossat, V., Combes, D. and Marty, A. 1999. Continuous enzymatic transesterification of high oleic sunflower oil in a packed bed reactor: influence of the glycerol production - theory,

- test, and recommendations for experimental design and analysis. *Enzyme Microb. Technol.* 25(3):194-200.
- Dyerberg, J. 1986. Linolenate-derived polyunsaturated fatty acids and prevention of atherosclerosis. *J. Nutr. Rev.* 44: 125-134.
- Edwards, M. S., Wilson, D. B., Craven, T. E., Stafford, J., Fried, L. F., Wong, T.Y., Klein, R., Burke, G. L. and Hansen, K. J. 2005. Associations between retinal microvascular abnormalities and declining renal function in the elderly population: the Cardiovascular Health Study. *Am. J. Kidney Dis.* 46(2):214-224.
- Eigtved, P., T. T. Hansen and C. A. Miller. 1987. Fatty acid compositions of marine fish in Atlantic, The World Conference on Biotechnology for the Fats and Oils Industry, Hamburg, 1987-09-29.
- Ergan, F., Trani, M. and Andr, G. 1990. Production of glycerides from glycerol and fatty acids by immobilized lipases in non-aqueous media. *Biotechnol. Bioeng.* 35, 195-200.
- Ernst, W. and Patrick, J. 1997. Water activity and substrate concentration effects on lipase activity. *Biotechnol. Bioeng.* 55:798-809.
- FAO. 1988. Year book of fishery statistics commodities. Food and Agriculture Organization of the united nations. Vol.67. Fishery Series. 35.
- FAO. 2005. Year book of fishery statistics commodities. Food and Agriculture Organization of the united nations. Vol.45. Fishery Series. 25.
- Fernandez-Banares, F., Esteve, M., Navarro, E., Cabre, E., Boix, J., Abad-Lacruz, A., Klaassen, J., Planas, R., Humbert, P., Pastor, C. and Gassull, M. A. 1996. Changes of the mucosal n3 and n6 fatty acid status occur early in the colorectal adenoma-carcinoma sequence. *Gut.* 38(2): 254-259.
- Fomuso, L. B. and Akoh, C. C. 1997. Enzymatic modification of triolein: Incorporation of caproic and butyric acids to produce reduced-calorie structured lipids. *J. Am. Oil Chem. Soc.* 74: 269-272.
- Fomuso, L. B. and Akoh, C. C. 1998. Structured lipids: Lipase-catalyzed interesterification of tricaproin and trilinolenin. *J. Am. Oil Chem. Soc.* 75: 405-410.
- Fortin, P. T., Freiberg, A. A., Rees, R., Sondak, V. K. and Johnson, T. M. 1995. Malignant melanoma of the foot and ankle. *J. Bone Joint Surg. Am.* 77(9): 1396-1403.

- Frense, D., Lange, U. and Hartmeir, W. 1996. Immobilization of *Candida rugosa* lipase in lyotropic liquid crystals and some properties of immobilized enzyme. *Biotechnol. Lett.* 18: 293-298.
- Fukui, T., Kawamoto, T., Sonomoto, K. and Tanaka, A. 1990. Long-term continuous production of optical active 2-(4-chlorophenoxy) propanoic acid by yeast lipase in organic solvent system. *Appl. Microbiol. Biotechnol.* 34: 330-334.
- Gamez-Meza, N., Noriega-Rodriguez, J.A., Medina-Juarez, L.A., Ortega-Garcia, J., Monroy-Rivera, J., Toro- Vazquez, F.J., Garcia, H.S and Angulo-Guerrero, O. 2003. Concentration of eicosapentaenoic acid and docosahexaenoic acid from fish oil by hydrolysis and urea complexation. *Food Res. Inter.* 36: 721-727.
- Garcia, H. S., Malcata, F. X., Reyes, H. R., Hill, C. G. and Amundson, C. H. 1992. Kinetics and mechanisms of reactions catalyzed by immobilized lipases. *Enzyme Microb. Technol.* 14 (6):426-446.
- Garcia, H. S., Arcos, J. A., Keough, K. J. and Hill Jr, C. G. 2001. Immobilized lipase-mediated acidolysis of butter oil with conjugated linoleic acid: batch reactor and packed bed reactor studies. *J. Mol. Cat. B: Enz.* 11(4-6): 623-632.
- Gill, I. and Valivety, R. 1997. Polyunsaturated fatty acids, Part 1: Occurrence, biological activities and applications. *Trends Biotechnol.* 15(10): 401-409.
- Greiner, K., Peetz, D., Winkgen, A., Prellwitz, W., Pfeiffer, N. and Hafner, G. 1999. Genetic thrombophilia in patients with retinal vascular occlusion. *Int. Ophthalmol.* 23(3): 155-160.
- Haagsma, N., van Gent, C. M., Luten, J. B., de Jong, R. W. and van Doorn, E. 1982. Preparation of an ω -3 fatty acid concentrate from cod liver oil. *J. Am. Oil Chem. Soc.* 59: 117-118.
- Handerson, S., Yip, C., Jordan, R. and Tam, W. 1999. Highly regio- and stereoselective intramolecular 1,3-dipolar cycloadditions of norbornadiene-tethered nitrile oxides. *Org. Lett.* 1(5): 791-794.
- Haraldsson, G. G., Kristinsson, B, Sigurdardottir, R., Gudmundsson, G. G. and Breivik, H. 1997. The preparation of concentrates of eicosapentaenoic acid and docosahexaenoic acid by lipase-catalyzed transesterification of fish oil with ethanol. *J. Am. Oil Chem. Soc.* 74: 1419-1424.

- Haraldsson, G. G. and Kristinsson, B. 1998. Separation of eicosapentaenoic acid and docosahexaenoic acid in fish oil by kinetic resolution using lipase. *J Am. Oil Chem. Soc.* 75: 1551-1556.
- Haraldsson, G. G., Kristinsson, B., Gudbjarnason, S. 1993. The fatty acid compositions of various lipid classes in several species of fish caught in Atlantic waters. *INFORM.* 4, 535.
- Haraldsson, G. G., Masson, M. and Loftsson, T. 2000. Review. Marine lipids for prodrugs, soft compounds and other pharmaceutical applications. *Pharmazie.* 55(3): 172-177.
- Harris, W. S. 2001. Omega-3 long-chain PUFA and triglyceride lowering: Minimum effective intakes. *Eur. Heart J. Suppl.* 3: D59-D61.
- Harris, W. S. 2004. Fish oil supplementation: Evidence for health benefits. *Clev. Clin. J. Med.* 71: 209-221.
- Harris, W. S., Park, Y. and Isley W. L. 2003. Cardiovascular disease and long-chain omega-3 fatty acids. *Curr. Opin. Lipidol.* 14: 914.
- Haumann, B. F. 1997. Nutritional aspects of n-3 fatty acids, *INFORM.* 8, 428-447.
- Henderson, R. J. 1999. The production of n-3 polyunsaturated fatty acids in marine organisms. *Lipid Technol.* 11: 5-10.
- Hibbeln, J. R. 1988. Fish consumption and major depression. *Lancet.* 351:1213-1234.
- Hills, M. J., Kiewitt, I. and Mukherjee, K. D. 1990. Enzymatic fractionation of fatty acids: Enrichment of α -linolenic acid and docosahexaenoic acid by selective esterification catalyzed by lipases. *J. Am. Oil Chem. Soc.* 67: 561-564.
- Hjaltason, B. 1989. New frontiers in the processing and utilization of fish oil. *Bibl Nutr Dieta.* 43: 96-106.
- Holmer, G. 1989. Triglycerides, In *Marine Biogenic Lipids, Fats and Oils. Vol. I.* (ed. Ackman, R. G.). p. 139-173, CRC Press, Inc., Boca Raton, Florida.
- Hoshino, T., Yamane, Y. and Shimizu, S. 1990. Selective hydrolysis of fish oil by lipase to concentrate n-3 polyunsaturated fatty acids. *Agric. Biol. Chem.* 54: 1459-1467.
- Hoy, C.-E. and Xu, X. 2001. Structured triacylglycerols, *In Structured and Modified Lipids* (ed. F.D. Gunstone). p. 209-240, Marcel Dekker. New York

- Irimescu, R., Furihata, K., Hata, K., Iwasaki, Y. and Yamane, T. 2001. Two-step enzymatic synthesis of docosahexanoic acid-rich symmetrically structured triglycerols *via* 2-monoacylglycerols. *J. Am. Oil Chem. Soc.* 78(7): 743-748.
- Iwasaki, Y., Hun, J. J., Narita, M., Rosu, R. and Yamane, T. 1999. Enzymatic synthesis of structured lipids from single cell oil of high docosahexaenoic acid content. *J. Am. Oil Chem. Soc.* 76(5): 563-569.
- Jangaard, P. M. 1996. Pilot plant fractionation of marine oils methyl esters. *J. Fisheries Res. Board of Canada.* 23: 681-687.
- Jansen, T. L., Janssen, M., de Jong, A. J. and Jeurissen, M. E. 1999. Post-streptococcal reactive arthritis: a clinical and serological description, revealing its distinction from acute rheumatic fever. *J. Intern. Med.* 245(3): 261-267.
- Jenning, B. H. and Akoh, C.C. 2001. Lipase catalyzed modification of fish oil to incorporated capric acid. *Food Chem.* 72: 273-278.
- Jeyasahoke, N. and Krisanungura, R. 1999. Concentration of EPA and DHA of tuna oil by lipases. *Research and Intellectual Property Promotion Center.* 23: 345-353.
- Jonsbo, F., Jorgensen, M. H. and Michaelsen, K. F. 1995. Review. Importance of n-3 and n-6 fatty acids for visual function and development in newborn infants. *Danish. Ugeskr Laeger.* 157(14): 1987-1991.
- Jonzo, M. D., Hiol, A., Zagol, I., Druet, D. and Comeau, L-C. 2000. Concentration of DHA from fish oil by selective esterification of cholesterol by immobilized isoforms of lipase from *Candida rugosa*. *Enzyme Microb. Technol.* 27: 443-450.
- Joseph, J. D., and Ackman. 1992. Capillary column gas chromatographic method for analysis of encapsulated fish oil and fish oil ethyl ester: collaborative study. *J. A.O.A.C. Inter.* 75: 488-506.
- Jumpsen, J. and Clandinin, M. T. 1995. *Brain Development: Relationship to Dietary Lipid and Lipid Metabolism*, A.O.C.S. Press, Champaign, Illinois.
- Kaewthong, W. and H-Kittikun, A. 2000. Monoacylglycerols production with immobilized lipase. *J. Sci. Technol.* 23(1): 149-157.
- Kaewthong, W. and H-Kittikun, A. 2004. Glycerolysis of palm olein by immobilized lipase PS in organic solvents. *Enzyme Microb. Technol.* 35: 218-222.

- Kalmin, B., Ely, J. J., Aivaliotis, M. J., Manis, G. S., VandeBerg, J. L. and Stone, W. H. 1999. Comparison of biochemical polymorphisms and short tandem repeat (STR) DNA markers for paternity testing in rhesus monkeys (*Macaca mulatta*). *Int. Med.* 37(11-12): 323-334.
- Kang, S. T., and Rhee, J. S. 1989. Characteristics of immobilized lipase-catalyzed hydrolysis of olive oil of high concentrate in reverse phase system. *Biotechnol. Bioeng.* 33: 1469-1476.
- Kawashima, A., Shimada, Y., Yamamoto, M., Sugihara, A., Nagao, T., Komenmushi, S. and Tomi, Y. 2002. Enzymatic synthesis of high-purity structured lipids with caprylic acid at 1,3-positions and polyunsaturated fatty acids at 2-position. *J. Am. Oil Chem. Soc.* 78: 611-616.
- Kazlauskas, R. J. and Bornscheuer, U. T. 1997. Biotransformation with lipases. *In Biotechnology VIII: Biotransformation.* (ed. Rehm, H. J., Reed, G., Puhler, A., Stadler P. J. M. and Kelly, D. R.). p. 226-274, Wiley-VCH Verlag GmbH, Weinheim.
- Kennedy, J. F. and Cabral, J. M. S. 1987. Enzyme immobilization. *In Biotechnology VIIa: Enzyme Technology.* (ed. Kenedy, J.F.). p. 347-404., Wiley-VCH, Weinheim.
- Kinsella, J. E. And Kella, N. K. 1988. Structural stability of beta-lactoglobulin in the presence of kosmotropic salts: A kinetic and thermodynamic study. *Int. J. Pept. Protein Res.* 32 (5):396-405.
- Kinsella, J. E. 1986. Food components with potential therapeutic benefits: The n-3 polyunsaturated fatty acids of fish oils. *Food Technol.* 40(2): 89-97.
- Kinsella, J.E. 1990. Sources of omega-3 fatty acids in human diets. *In Omega-3 Fatty Acids in Health and Diseases.* (ed. R. S. Lces and M. Karel). Marcel Dekker Inc., New York.
- Klinkesorn, U., H-Kittikun, A., Chinachoti, P. and Sophanodora, P. 2004. Chemical tranesterification of tuna oil to enriched omega-3 polyunsaturated fatty acids. *Food Chem.* 87: 415-421.
- Knezevic, Z., Mojovic, L. and Adnadjevic, B. 1998. Plam oil hydrolysis by lipase from *Candida cylindracea* immobilized on zeolite type Y. *Enzyme Microb. Technol.* 22: 275-280.
- Kodali, D. R., Fahey, D. A. and Small, D. M. 1990. Structure and polymorphism of saturated monoacid 1,2-diacyl-*sn*-glycerols. *Biochemistry.* 29(48):10771-10779.

- Kosuki, Y. and Tomisuka, N. 1995. Continuous lipolysis reactor with a loop connecting immobilized lipase column and oil-water separation. *J. Am. Oil Chem. Soc.* 72: 1329-1332.
- Kosuki, Y., Kunieda, T. and Azama, N. 1994. Continual conversion of free fatty acid in rice bran oil to triacylglycerol by immobilized lipase. *J. Am. Oil Chem. Soc.* 71: 445-448.
- Kosuki, Y., Tamaka, H. and Tomisuka, N. 1990. Continuous hydrolysis of oil by immobilized lipase in countercurrent reactor. *Biotechnol. Bioeng.* 36: 617-622.
- Kremer, I., Weinberger, D., Cohen, S., Lusky, M. and Ben-Sira, I. 1987. Implantation growth of an iris melanocytic lesion simulating a colliery body melanoma. *Ophthalmic Surg.* 18 (8):612-616.
- Kremer, J. M., Lawrence, D. A., Petrillo, G. F., Litts, L. L., Mullaly, P. M., Rynes, R. I., Stocker, R. P., Parhami, N., Greenstein, N. S. and Fuchs, B. R. 1995. Effects of high-dose of fish oil on rheumatoid arthritis after stopping nonsteroidal anti inflammatory drugs: A clinical and immune correlates. *Arthritis Rheum.* 38(8): 1107-1114.
- Kremer, L., Estaquier, J., Wolowczuk, I., Biet, F., Ameisen, J. C. and Loch, C. 2000. Ineffective cellular immune response associated with T-cell apoptosis in susceptible *Mycobacterium bovis* BCG-infected mice. *Infect Immun.* 68(7): 4264-4273.
- Kristensen, J. B., Xu, X. and Mu, H. 2005. Diacylglycerol synthesis by enzymatic glycerolysis: Screening of commercially available lipases. *J. Am. Oil Chem. Soc.* 82: 329-334.
- Kris-Etherton, P. M., Harris, W. S. and Appel, L. J. 2002. Omega-3 fatty acids and cardiovascular disease: New recommendations from the American heart association. *Arterioscler Thromb. Vasc. Biol.* 23: 151-152.
- Kungsuwan, A., Ittipong, B. and Oromdet, M. 1996. Oils from tuna by-products. *Kanpramong (in Thai).* 49: 71-79.
- Kwon, D. Y. and Rhee, J. S. 1986. A simple and rapid calorimetric method for determination of free fatty acid for lipase assay. *J. Am. Oil Chem. Soc.* 63(2): 89-95.
- Kwon, S. J., Han, J. J. and Rhee, J. S. 1995. Production and In situ separation of mono- or diacylglycerol catalyzed by lipase in n-hexane. *Enzyme Microb. Technol.* 17: 700-704.

- Kyle, D. 1991. Microbial ω -3 containing fats and oils for food use. *In Fat and Cholesterol Reduced Foods.* (ed. Chaberstroh and C. E. Morris.). p. 167-183, Portfolio Pub, Texas.
- Laane, C., Boeren, S., Vos, K. and Veegek, C. 1987. Rule for optimization of biocatalysis in organic solvent. *Biotechnol. Bioeng.* 30: 81-87.
- Hibbeln, J. R. 1998. Fish consumption and major depression. *Lancet.* 351:1213.
- Levine, J. H. 1997. Improved survival with an implanted defibrillator in patients with coronary disease at high risk for ventricular arrhythmia: Multicenter automatic defibrillator implantation trial investigators. *N. Engl. J. Med.* 335(26):1933-1940.
- Laugharne, J. D., Mellor, J. E. and Peet, M. 1996. Fatty acids and schizophrenia. *Lipids.* 31: 163-165.
- Lauritzen, L., Hansen, H. S., Jorgensen, M. H. and Michaelsen, K. F. 2001. The essentiality of long chain n-3 fatty acids in relation to development and function of the brain and retina. *Prog. Lipid Res.* 40: 194.
- Lee, K. T. and Akoh, C. C. 1997. Effect of selected substrate forms on the synthesis of structured lipids by two immobilized lipases. *J. Am. Oil Chem. Soc.* 74(5): 579-584.
- Lee, K. T. and Foglia, T. A. 2000. Fractionation of chicken fats triacylglycerols: synthesis of structures lipids with immobilized lipases. *J. Food Sci.* 65(5): 826-831.
- Lee, K. T., Foglia, T. A. and Oh, M. J. 2001. Lipase-catalyzed synthesis of structured lipids with fatty acids fractionated from saponified chicken fat and menhaden oil. *Eur. J. Lipid Sci. Technol.* 103: 777-772.
- Lee, K. T., Foglia, T. A. and Chang, K-S. 2002. Production of alkyl ester as biodiesel from fractionated lard and restaurant grease. *J. Am. Oil Chem. Soc.* 79: 191-195.
- Lee, S. Y. and Rhee, J. S. 1993. Production and partial purification of lipase from *Pseudomonas putida* 3SK. *Enzyme Microb. Technol.* 15: 617-623.
- Leonard, A. E., Pereira, S. L., Sprecher, H. and Huang, Y. S. 2004. Elongation of long-chain fatty acids. *Prog. Lipid Res.* 43: 36-54.
- Lokotch, W., Fritsche, K. and Syldatk, C. 1989. Resolution of D, L-menthol by interesterification with triacetin using the free and immobilized lipase of *Candida cylindracea*. *Appl. Microbiol. Biotechnol.* 31, 467-472.

- Macrae, A. R. 1983. Lipase-catalyzed interesterification of oils and fats. *J. Am. Oil Chem Soc.* 60(2): 291-294.
- Malcata F. X., Garcia, H. S., Reyes, H. R., Hill, C. G. and Amundson, C. H. 1990. Determination of the major free fatty acids in milkfat using a three-component mobile phase for HPLC analysis. *Biotechnol. Bioeng.* 45: 757-759.
- Malcata, F. X. 1994. Engineering of structured lipids with Lipases (ed. Malcata, F. X.). p. 234-278, Kluwer Academic, Dordrecht.
- Malcata, F. X., Reyes, H. R., Garcia, H. S., Hill, C. G., and Amundson, C. H. 1992. Kinetics and mechanisms of reactions catalyzed by immobilized lipases. *Enzyme Microb. Technol.* 14, 426-446.
- Mattson, F. H. and Volpenhein, R. A. 1994. The digestion and absorption of triacylglycerols. *J. Biol. Chem.* 239: 2772-2777.
- McNeill, G. P. and Yamane, T. 1991. Further improvements in the yield of monoglycerides during enzymatic glycerolysis of fats and oils. *J. Am. Oil Chem. Soc.* 68: 6-10.
- McNeill, G. P., Ackman, R. G. and Moore, S. R. 1996. Lipase-catalyzed enrichment of long-chain polyunsaturated fatty acids. *J. Am. Oil Chem. Soc.* 73: 1403-1407.
- Mensah, P., Gainer, J. L. and Carta, G. 1998. Adsorption control of water in esterification with immobilized enzymes: I. Batch reactor behavior. *Biotechnol. Bioeng.* 60: 434-444.
- Millqvist, A. Adlercreutz, P. and Mattiasson, B. 1994. Lipase-catalyzed alcoholysis of triglycerides for preparation of 2-monoglycerides. *Enzyme Microb. Technol.* 16: 1042-1047.
- Mishra, N. P., Mishra, R. K. and Singhal, G. S. 1993. Changes in the activities of anti-oxidant enzymes during exposure of intact wheat leaves to strong visible light at different temperatures in the presence of protein synthesis inhibitors. *Plant Physiol.* 102(3): 903-910.
- Miura, S., Ogawa, A. and Konishi, H. 1999. A rapid method for enzymatic synthesis and purification of structured triglycerols. 1,3-diluaroyl-2-oleoyl-glycerol. *J. Am. Oil Chem. Soc.* 76(8): 927-931.

- Monteiro, J. B., Nascimento, M. G. and Ninow, J. L. 2003. Lipase-catalyzed synthesis of monoacylglycerol in a homogeneous system. *Biotechnol. Lett.* 25: 641-644.
- Montero, S., Blanco, A., Virto, M. D., Landeta, L. C., Agud, I. and Solozabal, R. 1993. Immobilization of *Candida rugosa* lipase and some properties of the immobilized enzyme. *Enzyme Microb. Technol.* 15: 239-247.
- Moore, S. R. and McNeill, G. P. 1996. Production of triglycerides enriched in long-chain n-3 polyunsaturated fatty acids from fish oil. *J. Am. Oil Chem. Soc.* 70: 1409-1414.
- Morris, S. L., Low, S. H., A'Hern, R. P., Eisen, T. G., Gore, M. E., Nutting, C. M. and Harrington, K. J. 2004. A prognostic index that predicts outcome following palliative whole brain radiotherapy for patients with metastatic malignant melanoma. *Br. J. Cancer.* 91(5): 829-833.
- Mu, H., Kalo, P., Xu, X. and Hoy, C.-E. 2000. Chromatographic methods in the monitoring of lipase-catalyzed interesterification. *Eur. J. Lipid Sci. Technol.* 102: 202-211.
- Mu, H., Xu, X. and Hoy, C.-E. 1998. Production of specific structured triacylglycerols by lipase-catalyzed interesterification in a laboratory-scale continuous reactor. *J. Am. Oil Chem. Soc.* 75: 1187-1193.
- Mustranta, A., Forssell, P. and Poutanen, K. 1993. Application of immobilized lipases to tranesterification and esterification reactions in nonaqueous system. *Enzyme Microb. Technol.* 15: 133-139.
- Narayan, B., Miyashita, K. and Hosakawa, M. 2006. Review. Physiological effects of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). *Food Rev. Inter.* 22: 291-307.
- Nettleton, J. A. 1995. *Omega-3 Fatty Acids and Health*, Chapman and Hall, New York.
- Nettleton, J. A. and Katz, R. 2005. Review. n-3 Long-chain polyunsaturated fatty acids in type 2 diabetes. *J. Am. Diet. Assoc.* 105: 428-440.
- Nidhiprabha, B., Chamchan, C. and Cintakulchai, S. 2006. SPS and Thailand's exports of processed food(online). Available http://www.ris.org.in/ifsr_bhanupong_paper.pdf (2006. August 13).
- Okumura, S., Iwa, M., and Tsujisaka, Y. 1980. Purification and Properties of Partial Glyceride Hydrolase of *Penicillium cyclopium* M1. *J. Biochem.* 87, 205-211.

- Padmini, P., Rakshit, S.K. and Baradarajan, A. 1994. Kinetic of enzymatic hydrolysis of rice bran oil in organic system. *Enzyme Microb. Technol.* 16: 738-750.
- Pawongrat, R., Xu, X. and H-Kittikun, A. 2007. Synthesis of monoacylglycerol rich in polyunsaturated fatty acids from tuna oil by immobilized lipase AK. *Food Chem.* 104(1): 251-258.
- Pecnik, S. and Knez, Z. 1992. Enzymatic fatty ester synthesis. *J. Am. Oil Chem. Soc.* 69, 261-265.
- Peng, L., Xu, X. and Tan, T. 2000. Enzymatic production of high quality of monoacylglycerols. *In Research Advances in Oil Chemistry.* (ed. Mohan, R. M. S.). p. 53-78, GRN, Calcutta, India.
- Peng, L., Xu, X., Mu, H., Hoy, C-E. and Adler-Nissen, J. 2002. Production of structured phospholipids by lipase-catalyzed acidolysis: optimization using response surface methodology. *Enzyme Microb. Technol.* 31: 523-532.
- Pepping, J. 1999. Omega-3 essential fatty acids. *Am. J. Health-Sys. Phar.* 56: 719-724.
- Piyatheerawong, W., Iwasaki, Y., Xu, X. and Yamane, T. 2004. Dependency of water concentration on ethanolysis of trioleoylglycerol by lipases. *J. Mol. Cat. B: Enz.* 28: 19-24.
- Polak, J. T., Balaban, M., Peplow, A. and Philips, A. J. 1989. Supercritical carbon dioxide extraction of lipids from algae. *In Supercritical Fluid Science and Technology* (ed. K. P. Johnston and J. M. L.). p. 449-487, Penninger: ACS Symposium Series No. 406.
- Powlosky, R. J. 2001. Physiological compartmental analysis of alpha-linolenic acid metabolism in adult humans. *J. Lipid Res.* 42: 1257-1265.
- Radmer, R. J. 1990. Omega-3 fatty acids from algae. *In Omega-3 Fatty acids in Health and Diseases* (ed. R. S. Lees and M. karel.). p. 211-215, Marcel Dekker, Inc., New York.
- Rakshit, S. K., Vasuhi, R. and Kosugi, Y. 2000. Enrichment of polyunsaturated fatty acids from tuna oil using immobilized *Psuedomonas fluorescens* lipase. *Bioprocess Eng.* 23: 251-255.

- Ratnayake, W. M., Napolitano, G. E. and Ackman, R. G. 1988. Fatty acid components of larval *Ostrea edulis* (L.): importance of triacylglycerols as a fatty acid reserve. *Comp. Biochem. Physiol. B.* 90(4):875-883.
- Reyes, H. R. and Hill, C. G. 1994. Kinetic modeling of interesterification reaction catalyzed by immobilized lipase. *Biotechnol. Bioeng.* 43: 171-182.
- Rice, E. C. 1999. Functional food science and defense against reactive oxidative species. *Br. J. Nutr.* 80: S77-S112.
- Rizvi, S. S. H., Chao, R. R. and Liew, Y. J. 1988. Concentration of omega-3 fatty acids from fish oil using supercritical carbon dioxide. *In* *Supercritical Fluid Extraction and Chromatography: Techniques and Applications.* (ed. B. A. Charpentier and M. R. Sevenants.). p. 88-108., ACS sym, Series No.366. American Chemical Society Pub, Chicago.
- Roche, H. M. 2005. Fatty acids and the metabolic syndrome. *Proc. Nutr. Soc.* 64, 232-239.
- Rungsilp, S. 1998. Production of omega-3 enriched fish oil from tuna condensate. M. Sc. Thesis. Prince of Songkla University.
- Ruxton, C. H. S., Reed, S. C., Simpson, M. J. A. and Millington, K. L. 2004. The health benefits of omega-3 polyunsaturated fatty acids: a review of the evidence. *J. Human Nutri. Diet.* 17: 449-459.
- Sakiyama, T., Yoshimi, T., Tanaka, A., Ozaki, S., and Nakanishi, K. 2001. Analytical of monoglyceride synthesis reaction in a solvent-free two-phase system catalyzed by a monoacylglycerol lipase from *Pseudomonas* sp. LP7315. *Biochem. Eng. Sci.* 1: 88-90.
- Sangiovanni, J. P. and Chew, E. Y. 2005. The role of omega-3 long-chain polyunsaturated fatty acids in health and disease of the retina. *Pro. Retin. Eye Res.* 24: 871-878.
- Sarabok, A. 2000. Enrichment of ω -3 polyunsaturated fatty acids in tuna oils by two step enzymatic reactions with tree lipase. M. Sc. Thesis. Prince of Songkla University.
- Sargent, J. R., Bell, M. V., Bell, J. G., Henderson, R. J. and Tocher, D. R. 1995. Origins and functions of *n*-3 polyunsaturated fatty acids in marine organisms. *In* *Phospholipids: Characterization, Metabolism and Novel Biological Applications* (ed. Cevc, G., Paltauf, F.).p. 248-258., Chapter 21, A.O.C.S Press, Champaign, Illinois.

- Schmid, U. Bornscheuer, U. T., Soumanou, M. M., McNeill, G. P. and Schmid, R. D. 1999. Highly selective synthesis of 1,3-oleoyl-2-palmitoylglycerol by lipases catalysis. *Biotechnol. Bioeng.* 64(6): 678-684.
- Senanayake, S. P. J. and Shahidi, F. 1999. Enzymatic incorporation of docosahexaenoic acid into borage oil. *J. Am. Oil Chem. Soc.* 76(9): 1009-1015.
- Seong, C., Dai, S. T., Jiyoung, K and Kim, I. O. 1996. Lipase-catalyzed resolution of primary alcohol containing quaternary chiral carbon. *Biotechnol. Lett.* 18(12), 1419-1422.
- Seven Seas. 1994. A history of British cod liver oils. *In The First 50 Years with Seven Seas.*, Martin Books, Cambridge, UK.
- Shahidi, F. and Wanasundara, U. N. 1998. Omega-3 fatty acid concentrates: Nutritional aspects and production technologies. *Trends Food Sci. Technol.* 9:230-240.
- Shimada, Y., Maruyama, K., Nakamura, M., Nakayama, S., Shugihara, A. and Tominaga, Y. 1995. Selective hydrolysis of polyunsaturated fatty acid-containing oil with *Geotrichum candidum* lipase. *J. Am. Oil Chem. Soc.* 72: 1577-1581.
- Shimada, Y., Maruyama, K., Okazaki, S., Nakamura, M., Sugihara, A. and Tominaga, Y. 1994. Enrichment of polyunsaturated fatty acids with *Geotrichum candidum* lipase. *J. Am. Oil Chem. Soc.* 71: 951-954.
- Shimada, Y., Maruyama, K., Sugihara, A., Moriyama, S. and Tominaga, Y. 1997a. Purification of docosahexaenoic acid from tuna oil by two-step enzymatic method: hydrolysis and selective esterification. *J. Am. Oil Chem. Soc.* 74(11): 1441- 1446.
- Shimada, Y., Sugihara, A., Nakano, H., Kuramoto, T., Nagao, T., Gemba, M. and Tominaga, Y. 1997b. Purification of docosahexaenoic acid by selective esterification of fatty acid from tuna oil with *Rhizopus delemar* lipase. *J. Am. Oil Chem. Soc.* 74(2): 97-101.
- Shimada, Y., Watanabe, Y., Samukawa, T. and Sugihara, A. 1999. Conversion of vegetable oil to biodiesel using immobilized *Candida antarctica* lipase. *J. Am. Oil Chem. Soc.* 76, 789-792.
- Sim, J. S., Cherian, G. and Jiang, Z. 1992. \square -Linolenic acid metabolism: the chicken and the egg. *Int. J. Appl. Basic Nutri. Sci.* 8(3): 221-222.

- Simopoulos, A. 1991. Omega-3 fatty acids in health and disease and in growth and development. *Am. J. Clin. Nutri.* 54 : 438-463.
- Simonsen, S., Gjersvik, P., Hansen, S., Moller, B., Leivestad, T., Geiran, O., Pfeffer, P. and Fauchald, P. 2000. Are heart transplant recipients more likely to develop skin cancer than kidney transplant recipients?. *Transpl. Int.* 13: S380-381.
- Siscovick, D., Raghunathan, T., King, I., Weinmann, S. and Wicklund, K. 1995. Dietary intake and cell membrane level of a long-chain n-3 poly saturated fatty acids and risk of primary cardiac arrest. *JAMA.* 274: 1363-1367.
- Sonntag, N. O. V. 1979. Structure and composition of fats and oils. *In* Bailey' s Industrial Oil and Fat Products. 3rd Ed. (ed. Swern, D.). p. 1-98. John Wiley & Sons, New York.
- Soumanou, M. M., Bornscheuer, U. T., Menge, U. and Schmid, R. D. 1997. Synthesis of structured triglycerides from peanut oil with immobilized lipase. *J. Am. Oil Chem. Soc.* 74(4): 427-433.
- Soumanou, M. M., Bornscheuer, U. T. and Schmid, R. D. 1998. Two-step enzymatic reaction for synthesis of pure structured triglycerides. *J. Am. Oil Chem. Soc.* 75(6): 703-710.
- SPSS, SPSS for window. Release 11.0.0 (19 Sep 2001) standard version. *SPSS Institute*, Cary, NC (1989-2001).
- Stansby, M. E. 1990. Nutritional properties of fish oil for human consumption-early development. *In* Fish Oils in Nutrition. (ed. stansby, M. E.). p. 268-288., Chapter 10, van Nostrand Reinhold, New York.
- Stoll, B. J., Temprosa, M., Tyson, J. E., Papile, L. A., Wright, L. L., Bauer, C. R., Donovan, E. F., Korones, S. B., Lemons, J. A., Fanaroff, A. A., Stevenson, D. K., Oh, W., Ehrenkranz, R. A., Shankaran, S. and Verter, J. 1999. Dexamethasone therapy increases infection in very low birth weight infants. *Pediatrics.* 104(5):63-70.
- Suzuki, H., Beckh, S., Kubo, H., Yahagi, N., Ishida, H., Kayano, T., Noda, M. and Numa, S. 1988. Functional expression of cloned cDNA encoding sodium channel III. *FEBS. Lett.* 288: 195-200.

- Svennerholm, L. 1968. Distribution and fatty acid compositions of phosphoglycerides in normal human brain. *J. Lipid Res.* 9: 570-579.
- Tanaka, Y., Hirano, J. and Funada, T. 1992. Concentration of docosahexaenoic acid in glyceride by hydrolysis of fish oil with *Candida cylindracea* lipase. *J. Am. Oil Chem. Soc.* 69: 1210-1214.
- Thude, S., Shunkun, L., Said, M. B. and Bornscheuer, U. T. 1997. Lipase-catalyzed synthesis of monoacylglycerides by glycerolysis of camphor tree seed oil and cocoa-butter. *Fett. Lipid.* 99: 246-250.
- Torben, H. R., Yang, T., Mu, H., Jacobsen, C. and Xu, X. 2005. Enzymatic interesterification of butterfat with rapeseed oil in a continuous packed bed reactor. *J. Agric. Food Chem.* 53: 5617-5624.
- Torres, C. F., Munir, F., Blanco, R. M., Otero, C. and Hill, C. G. 2002. Catalytic transesterification of corn oil and tristearin using immobilized lipases from *Thermomyces lanuginose*. *J. Am. Oil Chem. Soc.* 79: 775-781.
- Turner, N. A., Vulfson, E. N. 2000. At what temperature can enzymes maintain their catalytic activity?. *Enzyme Microb. Technol.* 27:108-113.
- Uauy, R. and Valenzuela, A. 2000. Marine oils: the health benefits of *n*-3 fatty acids. *Nutrition.* 16: 680-684.
- US Federal Register. 1989. Margarine; Standard of Identity To Permit Use of Any Form of Oil of Marine Species Affirmed as GRAS or Approved as a Food Additive for this Use. *Fed. Reg.* May 25, 1989.
- van der Padt, A., Keurentjes, J. T. F., Sewalt, J. J. W., van Dam, E. M., van Drop, L. J. and van't Riet, K. 1990. Enzymatic synthesis of monoacylglycerides in membrane bioreactor with an in-line adsorption column. *J. Am. Oil Chem. Soc.* 69: 748-745.
- Vaskovsky, V. E. 1989. Phospholipids. *In* Marine Biogenic Lipids, Fats and oils (ed. Ackman, R. G.). p. 199-242 Vol. I, CRC Press Inc., Boca raton, Florida.
- Villeneuve, P., Pina, M., Monten, D. and Graille, J. 1995. *Carica papaya* latex lipase: sn-3 stereoselectivity or short-chain selectivity? Model chiral triglycerides are removing the ambiguity. *J. Am. Oil Chem. Soc.* 72: 753-755.

- Vitro, M. D., Agud, I., Montero, S., Blanco, A., Solozabal, R., Lascarray, J. M., Liama, M. J., Serra, J. L., Landeta, L.C. and Renobales, M. 1994. Hydrolysis of animal fat by immobilized *Candida rugosa* lipase. *Enzyme Microb. Technol.* 16: 61-65.
- Wanasundara, U. N. and Shahidi, F. 1998. Omega-3 fatty acid concentrates: Nutritional aspects and production technologies. *Trends Food Sci. Technol.* 9(6): 230-240.
- Ward, O. P., Fang, J. and Li, Z. 1997. Lipase-catalyzed synthesis of sugar ester containing arachidonic acid. *Enzyme Microb. Technol.* 20: 52-56.
- Will, W. M. and Marangoni, A. G. 1999. Assessment of lipase- and chemical catalyzed lipid modification strategies for the production of structured lipid. *J. Am. Oil Chem. Soc.* 76 (4): 443-450.
- Wong, D. W. S. 1995. *Food Enzyme: Structure and Mechanism*. p. 170-200., Chapman & Hall, New York.
- Wongsakul, S., Bornscheuer, U. T., and H-Kittikun, A. 2000. Lipase-catalyzed acidolysis and phospholipase D-catalyzed transphosphatidylation of phosphocholine. *Eur J. Lipid Sci. Technol.* 106(10): 665-670.
- Wongsakul, S., H-Kittikun, A. and Bornscheuer, U. T. 2003. Lipase-catalyzed synthesis of structured triacylglycerides from 1,3-diacylglycerides. *J. Am. Oil Chem. Soc.* 81(2): 151-155.
- Wongsakul, S., Prasertsan, P., Bornscheuer, U. T., and H-Kittikun, A. 2004. Synthesis of 2-monoglycerides by alcoholysis of palm oil and tuna oil using immobilized lipases. *Eur J. Lipid Sci. Technol.* 105: 68-73.
- Xu, X. 2002. Response surface methodology for experimental optimization. *Lipid Technol.* 145-147.
- Xu, X., Balchen, S., Hoy, C.-E. and Adler-Nissen, J. 1998. Pilot batch production of specific structured lipids by lipase catalyzed interesterification: preliminary study on incorporation and acyl migration. *J. Am. Oil Chem. Soc.* 75:301-308.
- Xu, X., Fomuso, L. B., and Akoh, C. C. 2000. Modification of Menhaden oil by enzymatic acidolysis to produce structured lipid: optimization by response surface design in packed bed reactor. *J. Am. Oil Chem. Soc.* 77: 171-176.

- Xu, X., Mu, H., Hoy, C.-E. and Adler-Nissen, J. 1999. Production of specifically structured lipids by enzymatic interesterification in a pilot enzyme in packed bed reactor: process optimization by response surface methodology. *Fett. Lipid.* 101: 207-214.
- Xu, X., Skands, A. R. H., Adler-Nissen, J. and Hoy, C. E. 1997. Production of specific structured lipids by enzymatic interesterification: optimization of the reaction by response surface design. *Fett. Lipid.* 100: 463-471.
- Yahya, M. T. Cassels, J. M., Straub, T. M. and Gerba, C. P. 1989. Reduction of microbial aerosols by automatic toilet bowl cleaners. *J. Environ. Health.* 55: 32-34.
- Yamane, T. 1987. Enzyme technology for the lipid industry: An engineering overview. *J. Am. Oil Chem. Soc.* 64(2): 1657-1661.
- Yamane, T., Kang, S. T., Kawahara, K., and Koizumi, Y. 1994. High-yield diacylglycerol formation by solid-phase enzymatic glycerolysis of hydrogenated beef tallow. *J. Am. Oil Chem. Soc.* 71: 339-342.
- Yamane, T. and Iwasaki, Y. 2000. Enzymatic synthesis of structured lipids. *In Advances in Biochemical Engineering/Biotechnology, Vol.9*, (ed. Yamane, T.). p. 151-171, Springer, Berlin / Heidelberg, New York.
- Yamprayoon, J. and Virulhakul, P. 1999. Fish processing industry and waste utilization in Thailand. *Fish Technol.* 3: 80-92.
- Yang, B. and Parkin, K. L. 1994. Monoacylglycerol production from butter oil by glycerolysis with a gel-entrapped microbial lipase in microaqueous media. *J. Food Sci.* 59: 47-52.
- Yang, L. Y., Kuksis, A. and Myher, J. J. 1990. Lipolysis of menhaden oil triacylglycerols and the corresponding fatty acid alkyl esters by pancreatic lipase in vitro: a reexamination. *J. Lipid Res.* 31(1): 137-147.
- Yang, M. H., Chang, C. C. and Chen, R. H. 1992. Effect of solvent polarity and fractionation temperature on the physicochemical properties of squid viscera stearin. *J. Am. Oil Chem. Soc.* 69: 1192-1197.
- Yang, T., Rebsdorf, M., Engelrud, U., and Xu, X. 2005. Enzymatic production of monoacylglycerols containing polyunsaturated fatty acids through an efficient glycerolysis system. *J. Agri. Food Chem.* 53: 1475-1481.

- Yehuda, R., Teicher, M., Trestman, R., Levengood, R. and Siever, L. 1996. Cortisol regulation in posttraumatic stress disorder and major depression: A chronobiological analysis. *Biol. Psychiatry*. 40(2):79-88.
- Yokochi, T., Usita, M. T., Kamisaka, Y., Nakahara, T. and Suzuki, O. 1990. Increase in the α -linolenic acid content by solvent winterization of fungal oil extracted from *Mortierella* Genus. *J. Am. Oil Chem. Soc.* 67: 846-851.
- Zaks, A. and Klibanov, A. M. 1984. Enzymatic catalysis in organic media at 100 degrees °C. *Science*. 224: 1249-1251.
- Zhang, H., Xu, X., Nilsson, J., Mu, H., Adler-Nissen, J. and Hoy, C. E. 2001. Production of marine fats by enzymatic interesterification with silica-granulated *Thermomyces lanuginosa* lipase in large-scale study. *J. Am. Oil. Chem Soc.* 78: 57-64.
- Zhou, D., Xu, X., Mu, H., Hoy, C. E. and Adler-Nissen, J. 2001. Synthesis of structured triglycerols containing capaic by lipase-catalyzed acidolysis: Optimization by response surface methodology. *J. Agric. Food Chem.* 49: 5571-5777.
- Zuta, C. P., Simpson, B. K., Chan, H. M. and Phillip, L. 2003. Concentrating PUFA from mackerel processing waste. *J. Am. Oil. Chem. Soc.* 80(9): 933-936.