

Food Science
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Project Number: MAS00200101667

The Role of Nitric Oxide Synthase and peroxynitrite on Oxidative Stability of Muscle Foods

Performing Department: Food Science -- 1120

Connolly, B.J.; Brannan, R.G.; Decker, E.A. Potential of peroxynitrite to alter color of myoglobin in muscle foods. . J. Agric. Food Chem. 2002, 50, 5220-5223.

Brannan, R.G.; Decker, E.A. Nitric oxide synthase activity in muscle foods. Meat Science, 2002, 62, 229-235.

Brannan, R.G.; Decker, E.A. Peroxynitrite-induced oxidation of lipids: Implications for muscle foods J. Agric. Food Chem. 2001, 49, 3074-3079

Brannan, R.G.; Connolly, B.J.; Decker, E.A. Peroxynitrite: A potential inhibitor of lipid oxidation in food. Trends Food Sci. Technol. 2001, 12, 164-173.

Project Number: MAS0020014526

Efficacy of Producing Stable w-3 Fatty Acid-Enhanced Foods to Improve Human Health

Performing Department: Food Science -- 1120

Hu, M.; McClements, D.J.; Decker, E.A. Lipid oxidation in corn oil-in-water emulsions stabilized by casein, whey protein isolate and soy protein isolate J. Agric. Food Chem. 2002, in press.

Hu, M.; McClements, D.J.; Decker, E.A. Impact of whey protein emulsifiers on the oxidative stability of salmon oil-in-water emulsions. J. Agric. Food Chem. 2002, in press.

Kim, H-J.; Decker, E.A.; McClements, D.J. Influence of sucrose on droplet flocculation in hexadecane oil-in-water emulsions stabilized by beta-lactoglobulin. J. Agric. Food Chem. 2002, submitted.

Kim, H-J.; Decker, E.A.; McClements, D.J. Impact of protein surface denaturation on droplet flocculation in hexadecane oil-in-water emulsions stabilized by beta-lactoglobulin. J. Agric. Food Chem. 2002, 50:7131-7137.

Project Number: MAS00762

NUTRIENT BIOAVAILABILITY - A KEY TO HUMAN NUTRITION

Performing Department: Food Science -- 1120

Baublis, A.J., Lu, Changrun., Clydesdale, F.M. and Decker, E.A. 2000. Potential of Wheat-Based Breakfast Cereals as a Source of Dietary Antioxidants. J. Amer. Coll. Nutr. 19:308S-311S.

Baublis, A., Decker, E.A. and Clydesdale, F.M. 2000. Antioxidant Effect of Aqueous Extracts from Wheat-Based Ready-to-Eat Breakfast Cereals. Food Chem. 68:1-6.

Baublis, A.J., Clydesdale, F.M. and Decker, E.A. 2000. Antioxidants in Wheat-Based Breakfast Cereals. Cereal Foods World. 45: 71-74.

Decker, E.A.; Ivanov, V.; Zhu, B.Z.; Frei, B. Inhibition of low density lipoprotein oxidation by carnosine and histidine. J. Agric. Food Chem. 2001, 49, 511-516.

Project Number: MAS00798

SPORULATION SIGNALS FROM ENTEROTOXIN - POSITIVE AND - NEGATIVE STRAINS OF CLOSTRIDIUM PERFRINGENS

Performing Department: Food Science -- 1120

Labbe, R. and Juneja, V. 2002. Clostridium perfringens. p. 119-126. In: D. Cliver and H. Riemann (eds.). Foodborne Diseases, 2nd ed. Elsevier Science.

Project Number: MAS00804

MECHANISMS OF LIPID OXIDATION IN FOOD EMULSIONS

Performing Department: Food Science -- 1120

Cho, Y-J.; McClements, D.J.; Decker, E.A. Ability of surfactant micelles to alter the physical location and reactivity of iron in oil-in-water emulsions. J. Agric. Food Chem. 2002, 50, 5704-5710.

Decker, E.A., McClements, D.J., Chaiyasit, W., Nuchi, C., Sivistre, M.P.C., Mancuso, J.R., Tong, L.M. and Mei, L. Factors Influencing Free Radical Formation in Food Emulsions. In. Free Radicals in Health and Food. Ed. C.T. Ho and F. Shahidi. 2002, ACS Press, pp. 83-97.

Project Number: MAS00811

WATER DYNAMICS IN MOISTURE LIMITED FOOD ENVIRONMENTS

Performing Department: Food Science -- 1120

Atichokudomchai, N., Shobsngob, S., Chinachoti, P., and Varavinit, S. 2001. A study of some physicochemical properties of high-crystalline tapioca starch. *Starch/Starke* 53: 577-581.

Hardas, N., Danviriyakul, S., Foley, J. L., Nawar, W. W., and Chinachoti, P. 2002. Effect Of Relative Humidity On The Oxidative And Physical Stability Of Encapsulated Milk Fat. *JAOCS* 79, 151-158.

Vittadini, E., Dickinson, L. C., and Chinachoti, P. 2002. NMR water mobility in xanthan and locust bean gum mixtures: possible explanation of microbial response. *Carbohydrate Polymers*. 49 : 261-269.

Danviriyakul, S., McClements, D. J., Decker, E., Nawar, W. W., and Chinachoti, P. 2002. Physical Stability of Spray-Dried Milk Fat Emulsion as Affected by Emulsifiers and Processing Conditions. *J. Food Sci.* 67(6): 2183-2189.

Atichokudomchai, N., Varavinit, S. and Chinachoti, P. 2002. A study of annealing and freeze-thaw stability of acid modified tapioca starches by differential scanning calorimetry (DSC). *Starch*. 54 (8): 343-349.

Atichokudomchai, N., Varavinit, S. and Chinachoti, P. 2002. Gelatinization transitions of acid-modified tapioca starches by differential scanning calorimetry (DSC). *Starch*. 54(7):296-302.

Baik, M.-Y., and Chinachoti, P. 2002. Effect of Glycerol and Storage Method on Mechanical Properties of White Bread. *Cereal Chem.* 79(3):376-382.

Hallberg, L.M. and Chinachoti, P. 2002. A fresh perspective on staling:: the significance of starch recrystallization on the firming of bread. *J. Food Sci.* 67 (3): 1092-1096.

Project Number: MAS00831

Influence of cosolvents on protein functionality in food emulsions and gels

Performing Department: Food Science -- 1120

E. Keowmaneechai, & D.J. McClements (2002). Effect of CaCl₂ and KCl on physicochemical properties of model nutritional beverages based on whey protein stabilized oil-in-water emulsions. *Journal of Food Science*, 67, 665-671.

W. Chantrapornchai, D.J. McClements (2002). Influence of glycerol on optical properties and large-strain rheology of heat-induced whey protein isolate gels, *FOOD HYDROCOLLOID S*, 16, 461-466

W. Chantrapornchai, D.J. McClements (2002). Influence of NaCl on optical properties, large-strain rheology and water holding capacity of heat-induced whey protein isolate gels. *FOOD HYDROCOLLOID* 16, 467-476

W. Chantrapornchai, F.M. Clydesdale, D.J. McClements (2001). Influence of relative refractive index on optical properties of emulsions. *Food Research International*, 34, 827-835

D.J. McClements. (2001). Estimation of steric exclusion and differential interaction contributions to protein transfer free energies in aqueous cosolvent solutions. *Food Hydrocolloids*. 15, 355-363.

Project Number: MAS00834

Maximizing Yield and Value of Muscle Tissue Foods, Especially Fish

Performing Department: Food Science -- 1120

Kelleher, S.D., Livingston, M.B., Hultin, H.O. and Aciukewicz, T. 2001. Characteristics and storage stability of Atlantic hagfish. *J. Aquat. Food Prod. Technol.* 10, 4, 101-118.

Richards, M.P. and Hultin, H.O. 2001. Rancidity development in a fish model system as affected by phospholipids. *J. Food Lipids* 8, 215-230.

Richards, M.P. and Hultin, H.O. 2002. Contributions of blood and blood components to lipid oxidation in fish muscle. *J. Agric. Food Chem.* 50, 555-564.

Sigfusson, H. and Hultin, H.O. 2002. Partitioning of tocopherol in aqueous mixtures of triacylglycerols and isolated muscle membranes. *J. Am. Oil Chemists Soc.* 79, 691-697.

Hultin, H.O. 2002. Recent advances in surimi technology in: Recent Advances in Marine Biotechnology. Vol. 7 Seafood Safety and Human Health, R. Nagabhushananam and M. Fingerman, eds. Science Publishers, Inc. Enfield NH U.S.A.-Plymouth, U.K. pp. 241-251.

Hultin, H.O. and Kelleher, S.D. U.S. Patent No. 6,288,216B1. Process for isolating a protein composition from a muscle source and protein composition. September 11, 2001.

Hultin, H.O. and Liang, Y. High Efficiency protein extraction. U.S. Patent Application No. 60 372,247. April 12, 2002.

Hultin, H.O., Undeland, I., and Richards, M.P. Preservation of muscle protein products. U.S. Application No. 60 377, 624. May 3, 2002.

Undeland, I., Hultin, H.O. and Richards, M.P. Abstract. An aqueous fraction of cod Muscle inhibits hemoglobin-mediated oxidation of cod muscle membrane lipids. Lipidforum Seminar-Byproducts in the Marine Processing Industry - A Lipid Source for Fish Feed and Food?. National Technical Norwegian University, Trondheim, Norway, May 29-31, 2002.

Sigfusson, H. and Hultin, H.O. Abstract. Partitioning of exogenous tocopherol between the triacylglycerol- and membrane lipid fractions of chicken leg muscle. IFT Annual Meeting Book of Abstracts, June 16-19, 2002, Anaheim, CA. Abstract No. 46G-8.

Choi, M.R., Park, J.W., Feng, Y. and Hultin, H.O. 2002. Abstract. Reduction of ionic strength in fish proteins and its effect on gel characteristics. Ibid. Abstract No. 76E-12.

Davilla, M.A. and Hultin, H.O. Abstract. Delta-tocopherol and its distribution in the lipids of chicken muscle tissue. III Venezuelan Congress of Food Science & Technology and II Pan-American Congress of Food Sanitary Quality. June 29-July 3, 2002, Caracas.

Undeland, I., Hultin, H.O. and Richards, M.P. Abstract. An aqueous fraction of cod muscle inhibits hemoglobin-mediated oxidation of cod muscle membrane lipids. 32nd Meeting West European Fisheries Technologists' Association, May 13-15, 2002, Galway, Ireland. Abstract No. L45, p.90.

Kelleher, S.D., Feng, Y., Kristinsson, H..G., Hultin, H.O. and McClements, D.J. Abstract. Functional fish protein isolates prepared using low ionic strength, acid solubilization precipitation. Internat. Commem. Symposium, 70 Anniversary of the Japanese Society of Fisheries Science, Oct. 1-5, 2001, Yokohama, Japan.

Hultin, H.O. and Liang, Y. High efficiency protein extraction. U.S. Patent Application No. 60/372,247. April 12, 2002.

Project Number: MAS00835

Isoflavonoid Synthesis and Pathogen Control in Sprouts in response to Rosemary Phenolic Clonal Extracts

Performing Department: Food Science -- 1120

McCue, P. and Shetty, K. (2003) A role of amylase and peroxidase-linked polymerization in phenolic antioxidant mobilization in ark-germinated soybean and implications for health. Process Biochemistry, Submitted

Randhir, R. and Shetty, K. (2003) Microwave-induced stimulation of L-DOPA , phenolics and antioxidant activity in fava bean (*Vicia faba*) for Parkinson;s diet. Process Biochemistry, Submitted.

Project Number: MAS00836

Development of Methodology for Quantitative PCR Detection of Listeria monocytogenes & Escherichia coli O157:H7 in Meat

Performing Department: Food Science -- 1120

Guan, J. and Levin, R. E. 2002. Quantitative detection of Escherichia coli O157H7 in ground beef by the polymerase chain reaction. Food Microbiology. 19: 159-165.

Project Number: MAS00837

Bacterial Adhesion and Growth at Phase Interfaces

Performing Department: Food Science -- 1120

D. Djordjevic, M. Wiedmann, and L. A. McLandsborough. 2002. Microtiter plate assay for assessment of Listeria monocytogenes biofilm formation. Appl. Environ. Microbiol. 68:2950-2958.

Project Number: MAS00844

Engineering properties of foods and food systems-testing and mathematical modeling

Performing Department: Food Science -- 1120

Campanella, O. H. and Peleg, M. 2002. Squeezing flow viscometry for non-elastic semi liquid foods - Theory and Applications. Crit. Rev. Food Sci. Nutr. 42:241-264.

Peleg, M. 2002. Modeling and simulation of microbial survival during treatments with a dissipating lethal chemical agent. Food Res. Intl. 35:327-336.

Corradini, M.G., Engel, R. and Peleg, M. 2001. Sensory thresholds of consistency of semi liquid foods: Evaluation by squeezing flow viscometry. J. Texture Studies 32:143-154.

Campanella, O.H. and Peleg, M. 2001. Theoretical comparison of a new and the traditional method to calculate C. botulinum survival during thermal inactivation. J. Sci. Food Agric. 81:1069-1076.

Peleg, M., Pechina, C.M. and Cole, M.B. 2001. Estimation of the survival curve of Listeria monocytogenes during non-isothermal heat treatments. Food Res. Intl. 34:383-388.

Project Number: MAS00852

Effect of Animal Proteins on Iron Uptake

Performing Department: Food Science -- 1120

Vattem,D.A.,Seth.A. and Mahoney,R.R.2001.Chelation and reduction of iron by chicken muscle protein digests:the role of sulfhydryl groups.J.Sci.Food and Agric.81:1476-1480.

Diaz,M 2001.Influence of Chicken Muscle Proteins in the Production of Bioavailable Forms of Iron.M.S.Thesis,University of Massachusetts,Amherst,MA,USA.

Project Number: MAS019991521

Impact of Emulsifiers on the Oxidative Stability of Lipid Dispersions

Performing Department: Food Science -- 1120

Nuchi, C.D.; Hernandez, P.; McClements, D.J.; Decker, E.A. Ability of lipid hydroperoxides to partition into surfactant micelles and alter lipid oxidation rates in emulsions. *J. Agric. Food Chem.* 2002, 50, 5445-5449.

Richards, M.P.; Chaiyasit, W.; McClements, D.J.; Decker, E.A. Ability of surfactant micelles to alter the partitioning of phenolic antioxidants in oil-in-water emulsions. *J. Agric. Food Chem.* 2002, 50, 1254-1259.

Nuchi, C.D., McClements, D.J.; Decker, E.A. Impact of Tween 20 hydroperoxides and iron on the oxidation of methyl linoleate and salmon oil dispersions. *J. Agric. Food Chem.* 2001, 49, 4912-4916.

Tong, L.M.; Sasaki, S.; McClements, D.J.; Decker, E.A. Antioxidant Activity of Whey in a Salmon Oil Emulsion. *J. Food Sci.* 2000, 65, 1325-1329.

Chaiyasit, W.; Silvestre, M.P.C.; McClements, D.J.; Decker, E.A. Ability of surfactant tail group size to alter lipid oxidation in oil-in-water emulsions. *J. Agric. Food Chem.* 2000, 48, 3077-3080.

Tong, L.M.; Sasaki, S.; McClements, D.J.; Decker, E.A. Mechanisms of Antioxidant Activity of a High Molecular Weight Fraction of Whey. *J. Agric. Food Chem.* 2000, 48, 1473-1478.

Silvestre, M.P.C.; Chaiyasit, W.; Brannan, R.G.; McClements, D.J.; Decker, E.A. Ability of Surfactant Head Group Size to Alter Lipid and Antioxidant Oxidation in Oil-in-Water Emulsions. *J. Agric. Food Chem.* 2000, 48, 2057-2061.

Mancuso, J. R.; McClements, D.J.; Decker, E.A. Iron Accelerated Cumene Hydroperoxide Decomposition in Hexadecane and Trilaurin Emulsions. *J. Agric. Food Chem.* 2000, 48, 213-219.

Silvestre, M.P.C.; Decker, E.A.; McClements, D.J. Influence of Copper on the Stability of Whey Protein Stabilized Emulsions. *Food Hydrocolloids.* 1999, 13, 419-424.

Decker, E.A., McClements, D.J., Mancuso, J.R., Tong, L., Mei, L., Sasaki, S., Zeller, S.G. and Flatt, J.H. Impact of Emulsifiers on the Oxidative Stability of Lipid Dispersions High in Omega-3 Fatty Acids. In *Omega-3 Fatty Acids: Chemistry, Nutrition and Health*. Ed. J. Finely and F. Shahidi. 2001. ACS Press. pp. 243-257.

Decker, E.A. and McClements, D.J. Transition Metal and Hydroperoxide Interactions: An Important Determinant in the Oxidative Stability of Lipid Dispersions. *Inform* 2001, 12, 251-255

McClements, D.J. and Decker, E.A. 2000. Lipid oxidation in Oil-in-Water Emulsions: Impact of Molecular Environment on Chemical Reactions in Heterogeneous Food Systems. J. Food Sci. 2000, 65, 1270-1282.

Project Number: MAS019991529

Modification of Physical and Functional Properties of Fish Proteins by Low PH

Performing Department: Food Science -- 1120

Kristinsson, H.G. 2001. Evaluation of different methods to isolate cod Gadus morhua muscle myosin. J. Food Biochem. 25: 249-256.

Kristinsson, H.G. 2001. Conformational and functional changes in hemoglobin and myosin induced by pH: functional role in fish quality. Ph.D. dissertation, University of Massachusetts/Amherst. 234 pp.

Project Number: MAS02000-1687

High Rosmarinic Acid Spearmint Clonal Lines for Nutraceutical and Food Preservative Applications

Performing Department: Food Science -- 1120

Chun, S-S., Vatter, D.A., Lin, Y-T. and Shetty, K. (2003) Phenolic antioxidant activity and inhibition of Helicobacter pylori activity by clonal extracts of Origanum extracts. In preparation: Food Biotechnology.

Project Number: MAS0200001796

Distribution of Lipid-Soluble Antioxidants in Muscle Lipids and Effect on Stability

Performing Department: Food Science -- 1120

Davila, M.A. 2001. Distribution of delta-tocopherol between polar and neutral lipids of chicken leg muscle when added in solvents of different dielectric constants. M.S. Thesis, University of Massachusetts/Amherst. 88 pp.