

The toxicity of the degraded oil is normally evaluated by the weight loss, the survival rate, autopsy report, etc. However, the main symptoms of the food-poisoning incident caused by eating of degraded Instant Noodle were nausea and vomiting²⁾. In fact, there is few study with animal which evaluate the nausea and vomiting after administrated oxidized oil because no animal can vomit with the exception of monkey and ferret. To recognize the food-poisoning incidents happened in 1964-1965, to develop a new method which can analyze the nausea and vomiting with animal is indispensable. It has been known that pica²⁷⁾⁻³⁴⁾, a behavior characterized by eating a nonfood material such as kaolin, is related to the emesis. Animal that was administrated harmful compound is eager to eat non-nutritional kaolin to relieve malaise and the amount of kaolin consumption increases with the degree of the toxicity. Also, it has been recognized that the amount of consumption is related to the degree of gastrointestinal malaise, namely nausea and vomiting. This method might be able to utilize to understand the feeling of animal after fed oxidized oils. Therefore, several degree of oxidized oils extracted from degraded Instant Noodle were administrated to mice and pica was observed (Figure 4)³⁵⁾. All the mice administrated these oils were survived in 28 days sub-acute toxic study (data not shown), however, the amount of kaolin intake increased according to the degree of oil degradation. These results indicate that not severely oxidized oil also indicate harmful symptom in mice. In a previous paper¹⁰⁾, the oil oxidized over 400 meq/kg in PV was needed to observe the depression of the weight in rat. Therefore, the oil oxidized to around 100meq/kg in PV was recognized as safe in that paper.

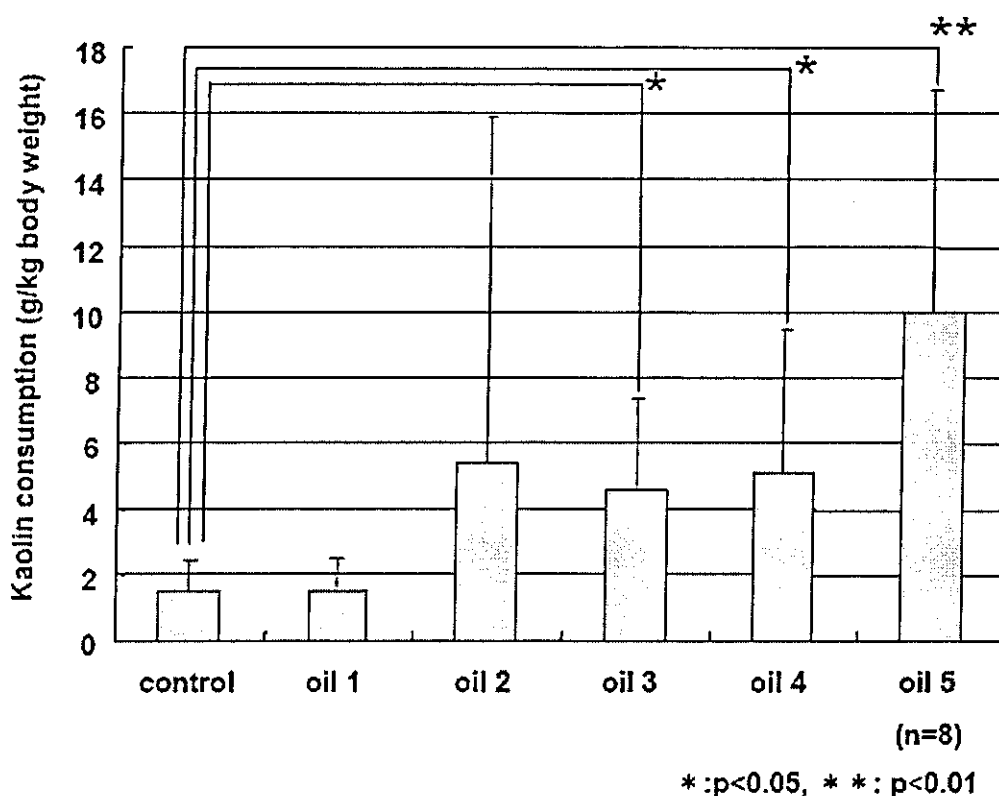


Figure 4. The comparison of kaolin consumption among control oil group and 5 kinds of oxidized oil groups. The control oil is extracted from not oxidized Instant Noodle. All kinds of oxidized oil were extracted from Instant Noodle exposed under sunlight in summer. The degradation degree of the oil increases with the sample number. Peroxide value of each oil is shown below.

Control: 2.1 meq/kg, Oil 1: 85.0 meq/kg, Oil 2: 107.2 meq/kg, Oil 3: 138.5 meq/kg,

Oil 4: 302.0 meq/kg, Oil 5: 334.0 meq/kg

However, harmful symptom was expressed when the oil oxidized to 138.5 meq/kg in PV was administrated in this pica experiment. Probably these would be correlated to nausea and vomiting in human and this level of oxidation is also harm to mice.

Summary

Oxidation of the oil is very apprehensive phenomenon for food safety because it involves formation of lipid hydroperoxide (indicated by PV) and the secondary oil oxidized product. This change can be measured by only PV, not by AV because PV and AV do not increase simultaneously. Consequently, measuring PV in oil is very important matter to grasp the deterioration level of the oil in food from the food safety point of view. The formation of lipid hydroperoxide is slow at first, however, it increase at an explosive pace after finish the induction period. To prevent this explosive increase of lipid hydroperoxide, to keep the PV at low level, 30 meq/kg in Japan, is a significant point.

From the point of view of keep the food safety, Japan strongly proposes including PV in food standard of Instant Noodle.

References

- 1) <http://www.instantramen.or.jp/english/index.html> (accessed Sep. 2004).
- 2) (in Japanese) Inagaki N., "Food-poisoning caused by Instant Noodl.," *Shokuhineiseikenkyu*, **16**, 370-379 (1966).
- 3) http://www.jetro.go.jp/se/e/standards_regulation/food2003mar-e.pdf (accessed Sep. 2004).
- 4) Crampton E. W., Farmer F. A. and Berryhill F. M., "The effect of heat treatment on the nutritional value of some vegetable oils.," *J. Nutr.*, **43**, 431-440 (1951).
- 5) Crampton E. W., Common R. H., Farmer F. A., Berryhill F. M. and Wiseblatt L., "Studies to determine the nature of the damage to the nutritive value of some vegetable oils from heat treatment II. Investigation of the nutritiousness of the products of thermal polymerization of linseed oil.," *J. Nutr.*, **44**, 177-189 (1951).
- 6) Raju N. V. and Rajagopalan R., "Nutritive value of heated vegetable oils.," *Nature*, **176**, 513-514 (1955).
- 7) Matsuo N., "Studies on the toxicity of fish oil.," *J. Biochem*, **41**, 481-487 (1954).
- 8) Kaneda, T., Sakai H. and Ishii S., "Nutritive value or toxicity of highly unsaturated fatty acids. II.," *J. Biochem*, **42**, 561-573 (1955).
- 9) Kaunitz H., Slanetz C. A. and Johnson R. E., "Antagonism of fresh fat to the toxicity of heated and aerated cottonseed oil.," *J. Nutr.*, **55**, 577-587 (1955).
- 10) Andrew J. S., Griffith W. H., Mead J. F. and Stein R. A., "Toxicity of air-oxidized soybean oil.," *J. Nutr.*, 199-210 (1960).
- 11) (in Japanese) Miura T., Matano K. and Miyaki K., "Studies on the poisonous products of edible oils and fat II. On the poisonous products and their toxicity of fats of Instant Chinese Noodle.," *Yukagaku*, **16**, 503-505 (1967).
- 12) (in Japanese) Miura T., Kudo M., Tsuchida M., Matano K. and Miyaki K., "Studies on the poisonous products of edible oils and fat III. On the autoxidation products derived from oil contained in Instant Chinese Noodle and their toxicity.," *Yukagaku*, **18**, 726-729 (1969).
- 13) (in Japanese) Kusaka H., Fukuzawa A. and Matsuo N., "Studies of oxidized denaturation of fat contained in the food. Effects of light and temperature on the "Instant Ramen".," *Eeiyo To Syokuryo*, **22**, 582-586 (1969).
- 14) Tovar L. R. G. and Kaneda T., "Studies on the toxicity of autoxidized oils. VI. Comparative toxicity of secondary oxidation products in autoxidized methyl linoleate." *Yukagaku*, **26**, 169-172 (1977).
- 15) IUPAC, "2.501 Determination of peroxide value (PV).," IUPAC Standard Methods for the Analysis of Oils, Fats and Derivatives (7th Revised and Enlarged Edition) Prepared by C. Paquot and A. Hautfenne, Blackwell Scientific Publications, Oxford, 2.501/1 (1992).
- 16) AOCS, "AOCS Official Method Cd 8-53 Peroxide Value Acetic Acid-Chloroform Method.," Official Methods and Recommended Practices of the AOCS Fifth Edition, AOCS, Champaign, IL, Cd 8-53 (1998).
- 17) AOCS, "AOCS Official Method Cd 8b-90 Peroxide Value Acetic Acid-Isooctane Method.," Official Methods and Recommended Practices of the AOCS Fifth Edition, AOCS, Champaign, IL, Cd 8b-90 (1998).
- 18) IUPAC, "2.201 Determination of the acid value (AV) and the acidity.," IUPAC Standard Methods for the Analysis of Oils, Fats and Derivatives (7th Revised and Enlarged Edition) Prepared by C. Paquot and A. Hautfenne, Blackwell Scientific Publications, Oxford, 2.201/1 (1992).
- 19) AOCS, "AOCS Official Method Cd 3d-63 Acid Value.," Official Methods and Recommended Practices of the AOCS Fifth Edition, AOCS, Champaign, IL, Cd 3d-63 (1998).
- 20) Gotoh N., Iwasawa A., Yokota J. and Wada S., under submitting.

- 21) Frankel, E. N. 1998. *Lipid Oxidation*. pp. 13-22, The Oil Press, Dundee.
- 22) Lea C. H., "Chemical and nutritional aspects of oxidised and heated fats." *Chem. Industry*, 244-248 (1965).
- 23) Frankel E. N., Smith L. M., Hamblin C. L., Creveling R. K. and Clifford A. J., "Occurrence of cyclic fatty acid monomers in frying oils used for fast foods." *J. Am. Oil Chem. Soc.*, 61, 87-90 (1984).
- 24) Frankel, E. N. 1998. *Lipid Oxidation*. pp. 43-54, The Oil Press, Dundee.
- 25) Kamal-Eldin A. 2003. *Lipid Oxidation Pathways*. pp. 1-4, AOCS Press, Champaign.
- 26) Gotoh N., Iwasawa A. and Wada S., under submitting.
- 27) Mitchell D., Laycock J. D. and Stephens W. F., "Motion sickness-induced pica in the rat." *J. Am. Clin. Nutr.*, 30, 147-150 (1977).
- 28) Watson P. J., Hawkins C., McKinney J., Beatey S., Bartles R. R. and Rhea K., "Inhibited drinking and pica in rats following 2-deoxy-D-glucose." *Physiol. Behav.*, 39, 745-752 (1987).
- 29) Morita M., Takeda N., Kubo T. and Matsunaga T., "Pica as an index of motion sickness in rats." *ORL J. Otorhinolaryngol. Rel. Spec.*, 50, 188-192 (1988).
- 30) Takeda N., Hasegawa S., Morita M. and Matsunaga T., "Pica in rats is analogous to emesis: an animal model in emesis research." *Pharmacol. Biochem. Behav.*, 45, 817-821 (1993).
- 31) Seeley R. J., Blake K., Rushing P. A., Benoit S., Eng J., Woods S. C. and D'Alessio D., "The role of CNS glucagons-like peptide-1 (7-36) amide receptors in mediating the visceral illness effects of lithium chloride." *J. Neurosci.*, 20, 1616-1621 (2000).
- 32) Yamamoto K., Takeda N. and Yamatodani A., "Establishment of an animal model for radiation-induced vomiting in rats using pica." *J. Radiat. Res.*, 43, 131-141 (2002).
- 33) Rudd J. A., Yamamoto K., Yamatodani A. and Takeda N., "Differential action of ondansetron and dexamethasone to modify cisplatin-induced acute and delayed kaolin consumption ("pica") in rats." *Eur. J. Pharmacol.*, 454, 47-52 (2002).
- 34) Yamamoto K., Matsunaga S., Matsui M., Takeda N. and Yamatodani A., "Pica in mice as a new model for the study of emesis." *Methods Find. Exp. Clin. Pharmacol.*, 24, 135-138 (2002).
- 35) Gotoh N., Watanabe H. and Wada S., under submitting.

Year	Title	Authors	Journal	Vol	Pages
1945	Toxicity of Rancid Fats	Quackenbush, E. W.	Oil & Soap	22	336-338
1949	Spectrophometric Studies of the Oxidation of Fats. VII. Coupled Oxidation of Carotene	Holman, R. T.	Archives Biochem.	21	51-57
1950	Spectrophometric Studies of the Oxidation of Fats. IX. Coupled Oxidation of Vitamin A Acetate	Holman, R. T.	Archives Biochem.	26	85-91
1951	Studies to Determine the Nature of the Damage to the Nutritive Value of Some Vegetable Oils from Heat Treatment II. Investigation of the Nutritiousness of the Products of Thermal Polymerization of Linseed Oil	Crampton E.W., Common R.H., Farmer F.A., Berryhill F.M. and Wiseblatt L.	J. Nutrition	4 4	177-189
1951	The effect of Heat Treatment on the Nutritional Value of Some Vegetable Oils	Crampton E.W., Common R.H., Farmer F.A. and Berryhill F.M.	J. Nutrition	43	431-440
1951	Studies to Determine the Nature of the Damage to the Nutritive Value of Some Vegetable Oils from Heat Polymerization	Crampton E.W.,	J. Nutrition	43	533-539
1952	Rancid Lard Effect on Rats Fed Complete and Riboflavin-Deficient Diets	Kaunitz, H., Johnson, R. E. and Slanetz, C.A.	J. Nutr.	46	151-159

1952	The Effect of Oxidized Fatty Acids on the Activity of Certain Oxidative Enzymes	Bernheim, F.	Arch. Biochem. Biophys.	38	177-184
1953	Studies to determine the nature of the damage to the nutritive value of some vegetable oils from heat treatment III. Segmentation of toxic and non-toxic material from the esters of heat-polymerized linseed oil by distillation and by urea adduct formation	Crampton E.W., Common R.H., Farmer F.A., Wells A.F. and Crawford D.	J. Nutrition	49	333-346
1954	Nutritive Value or Toxicity of Highly Unsaturated Fatty Acids.□	Kaneda, T., Sakai, H. and Ishii, S.	J. Biochem	41	327-335
1954	Studies on the Toxicity of Fish Oil	Matsuo N.	J. Biochem	41	481-487
1955	Nutritive Value of Heated Vegetable Oils	Raju N.V. and Rajagopalan R.	Nature	176	513-514
1955	Studies of the Mechanism of Vitamin E Action.□. <i>In vitro</i> Copolymerization of Oxidized Fats with Protein	Tappel, A. L.	Arch. Biochem. Biophys.	54	266-280
1955	The Inhibition of Certain Mitochondrial Enzymes by Fatty Acids Oxidized by Ultraviolet Light or Ascorbic Acid	Ottolenghi, A.	Arch. Biochem. Biophys.	56	157-164
1955	Nutritive Value or Toxicity of Highly Unsaturated Fatty Acids.□	Kaneda, T., Sakai, H. and Ishii, S.	J. Biochem	42	561-573
1955	Antagonism of Fresh Fat to the Toxicity of Heated and Aerated Cottonseed Oil	Kaunitz H., Slanetz C.A. and Johnson R.E.	J. Nutrition	55	577-587
1956	Biological Effects of the Polymeric Residues Isolated from Autoxidized Fats	Kaunitz H., Slanetz C.A. and Johnson R.E.	J. Am. Oil Chem. Soc	33	630-634
1956	Studies to Determine the Nature of the Damage to the Nutritive Value of Some Vegetable Oils from Heat Treatment	Crampton E.W.,	J. Nutrition	60	13-24
1956	Nutritional properties of the molecularly distilled fractions of autoxidized fats	Kaunitz H., Slanetz C.A., Johnson R.E. and Guilmain J.	J. Nutrition	60	237-244
1957	Studies on the nutritional and physiological effects of thermally oxidized oils	Johnson O.C., Perkins E., M. Sugai and Kummerow F.A.	J. Am. Oil Chem. Soc	34	594-597
1957	Studies to Determine the Nature of the Damage to the Nutritive Value of Menhaden Oil from Heat Treatment	Crampton E.W., Common R.H., Farmer F.A. and DeFreitas A.S.W.	J. Nutrition	62	341-347
1958	A Note on the Toxicities of Methyl Oleate Peroxide and Ethyl Linoleate Peroxide	Holman, R.T. and Greenberg, S.I.	J. Am. Oil Chem. Soc.	35	707
1958	Brown-Colored Oxypolymers of Unsaturated Fats	Venolia, A. W. et al.	J. Am. Oil Chem. Soc.	35	135-138
1959	Cyclization of Linolenic Acid by Alkali Isomerization	Scholfield, C.R., Cown, J.C.	J. Am. Oil Chem. Soc.	36	631-635
1959	A Note on the Preparation of Pure Oleic and Linoleic Acid	Keppler, J. G. and Sparreboom, S.	J. Am. Oil Chem. Soc.	36	308-309

1959	Influence of Feeding Fractionated Esters of Autoxidized Lard and Cottonseed Oil on Growth, Thirst, Organ Weights and Liver Lipids of Rats	Kaunitz H., Slanetz C.A., Johnson R.H., Knight H.B., Koos R.E. and Swern D.	J. Am. Oil Chem. Soc	36	611-615
1960	On the Digestion and Absorption of Lipoperoxides	Glavind, J. et al.	Acta. Physiol. Scand.	49	97-102
1960	A Nutritive Evaluation of Over-Heated Fats	Rice, E. E.	J. Am. Oil Chem. Soc.	37	607-613
1960	The American Oil Chemists' Society Fats in Human Nutrition	Kummerow, F. A.	J. Am. Oil Chem. Soc.	37	503-509
1960	Pharmacologic Effects of Fractions of Oxidized Oleate and Linoleate	Kaunitz H., Slanetz C.A., Johnson R.H., Knight H.B., Koos R.E. and Swern D.	Metab. Clin. & Exp.	9	59-66
1960	Nutritional and Chemical Changes Occuring in Heated Fats: A Review	Perkins E.G.	Food Technol.	10	508-514
1960	Nutritional Properties of Fresh Fats Added to Diets Containing Autoxidized Cottonseed Oil	Kaunitz, H.	J. Nutr.	70	521-527
1960	Toxicity of air-oxidized soybean oil	Andrews J.S., Griffith W.H. and Mead J.F.	J. Nutrition	70	199-210
1961	Heated Fats. □ Studies of the Effects of Heating on the Chemical Nature of Cottonseed Oil	Friedman, L.	J. Am. Oil Chem. Soc..	38	253-257
1961	Influence of Dietary Tallow on the Utilization of Calcium by the Laying Hen	Hunt, J.	Poultry Sci.	40	1193-1197
1961	Further Evidence for Cyclic Monomers in Heated Linseed Oil	MacDonald, J. A.	Can. J. Chem.	39	1906-1914
1962	Studies of the Generalized Shwartzman Reaction Produced by Diet	Kaunitz, H., Malins, D. C. and McKay, D. G.	J. Exp. Med.	115	1127-1136
1962	The Effect of Vitamin E Administration on Rats Fed Fresh or Autoxidized Beef Tallow	Krier, C.	Am. J. Vet. Res.	22	795-799
1962	Nutritive Value of Methyl Linoleste and Its Thermal Decomposition Products	Bonitto, N. R.	J. Am, Oil Chem. Soc.	39	25-27
1962	The Influence of Temperature, Heating Time, and Aeration upon the Nutritive Value of Fats	Poling, C.E. et al.	J. Am, Oil Chem. Soc.	39	315-320
1963	Toxicity of Fatty Acid Ester Hydroperoxides.(28809)	Olcott, H. S.	Proc. Soc. Exp. Biol. Med.	114	820-822
1963	Nutritive Value of Marine Oils. □ Effects of <i>in Vivo</i> Antioxidants in Feeding Menhaden Oil to Swine	Oldfield, J.E.	J. Am. Oil Chem. Soc.	40	357-336
1963	The Structure of a Cyclic C18 Acid from Heated Linseed Oil	Hutchison, R. B. and Alexander, J.C.	J. Org. Chem.	28	2522-2526
1964	Heated Fats and Allied Compounds as Carcinogens	Arffmann, E.	Acta. Path. Microbiol. Scand.	61	161-180
1965	The Reaction of an Autoxidized Lipid with Proteins	Andrews, F. et al.	J. Am. Oil Chem Soc.	42	779-781
1965	Chemical Reactions Involved in the Deep Fat Frying of Foods I.. A Laboratory Apparatus for Frying Under Simulated Restaurant Conditions	Krishnamurthy, R. G., Kawada, T. and Chang, S. S.	J. Am. Oil Chem Soc.	42	878-882

1965	Heated Fats. IV. Chemical Changes in Fats Subjected to Deep Fat Frying Processes: Cottonseed Oil	Perkins, E.G. and Van Akkeren, L. A.	J. Am. Oil Chem Soc.	42	782-785
1965	Chromatographic Studies on Oxidative and Thermal Fatty Acid Dimers	Evans, C. D.	J. Am. Oil Chem Soc.	42	764-776
1965	Mechanisms of Lipid Peroxide Formation in Tissues Role of Metals and Haematin Proteins in the Catalysis of the Oxidation of Unsaturated Fatty Acids	Wills, E. D.	Biochem. Biophys. Acta.	98	238-251
1965	Nutritive Value of Heated Vegetable Oils	Raju N.V., Narayana M., Rao and Rajagopalon R.	J. Am. Oil Chem. Soc	42	774-776
1965	A Long-Term Nutritional Study with Fresh and Mildly Oxidized Vegetable and Animal Fats	Kaunitz H., Johnson R.E. and Pegus L..	J. Am. Oil Chem. Soc	42	770-774
1966	Damage to proteins, Enzymes, and Amino Acids by Peroxidizing Lipids	Roubal, W. T. et al.	Arch. Biochem. Biophys.	113	5-8
1966	Polymerization of Proteins Induced by Free-Radical Lipid Peroxidation	Roubal, W. T. et al.	Arch. Biochem. Biophys.	113	150-155
1966	Oxidation of Reduced Glutathione by Subcellular Fractions of Rat Liver	Christophersen, B. O. et al.	Biochem. J.	100	95-101
1966	Inactivation of Glyceraldehyde 3-Phosphate Dehydrogenase by Linoleic Acid Hydroperoxide	Little, C. et al.	Biochem. J.	101	13p
1966	Oxidation of Small Thiols by Lipid Peroxides	Little, C. et al.	Biochem. J.	102	10p
1966	Chronic Toxicity of Methyl Linoleate Hydroperoxide for the Rabbit.	Kokatnur, M. G., Bergan J. G. and Draper, H. H.	Proc. Soc. Exp. Biol. Med.	123	254-258
1966	Effects of Moderate Levels of Oxidized Fat in Animal Diets under Controlled Conditions	Carpenter, K. J. et al.	Proc. Nutr. Soc.	25	25-31
1966	The Effect of Lipid Peroxides on the Biochemical Constituents of the Cell	O'Brien, P. J. et al.	Proc. Nutr. Soc.	25	9-18
1966	INCIDENCES NUTRITIONNELLES ET TOXICOLOGIQUES DE L'INGESTION D'HUILE DE LIN CHAUFFEE	Bpotteau B. and Cluzan R.	Annuls. Biol. Anim. Biochem. Biophys.	6	47-64
1967	Nutritional Aspects of Thermally Oxidized Fats & Oils	Kaunits H.	Food Technol.	21	278-280
1967	Autoxidation of polyunsaturated esters in water: chemical structure and biological activity of the products	Schauenstein, E.	J. Lipid Res.	8	417-428
1967	Chemical Reactions Involved in the deep Fat Frying of Foods. Identification of Acidic Volatile Decomposition Products of Corn Oil	Kawada, T., Krishnamurthy, R. G. Mookherjee, B.D. and Chang, S. S.	J. Am. Oil Chem Soc.	44	131-140
1967	Long-term Rat Feeding Study with Used Frying Fats	Nolen, G. A., Alexander, J. G. and Artman, N. R.	J. Nutr.	93	337
1967	The Effects of a Lipid Peroxide on Intracellular Metabolism	O'Brien, P. J. et al.	Biochem. J.	103	32p-33p
1968	On the postulated peroxidation of unsaturated lipids in the tissues of vitamin E-deficient rats	Bunyan, J. et al.	Brit. J. Nutr.	22	97-110
1968	An Intracellular GSH-Perxidase with a Lipid Peroxide Substrate	Little, C. et al.	Biochem. Biophy. Res. Commn.	31	145-150

1968	The Effectiveness of a Lipid Peroxide in Oxidizing Protein and Non-Protein Thiols	Little, C. et al.	Biochem. J.	106	419-423
1969	Synthesis and Characterization of Fluorescent Products Derived from Malonaldehyde and Amino Acids	Chio, K. S.	Biochemistry	8	2821-2827
1970	Free Radicals, Malonaldehyde and Protein Damage in Lipid-Protein Systems	Roubal, W. T.	Lipids	6	62-64
1970	Metabolism of 1-14C-Methyl Linoleate Hydroperoxide in the Rabbit	Findlay, G. M., Draper, H. H. and Bergan J. G.	Lipids	5	970-982
1971	Denatured Hemoproteins as Catalysts in Lipid Oxidation	Eriksson, C. E. et al.	J. Am. Oil Chem. Soc.	48	442-447
1971	Fat Oxidation at Low Oxygen Pressure: I. Kinetic Studies on Linoleic Acid Oxidation in Emulsions in the Presence of Added Metal Salts	Marcuse, R. E. et al.	J. Am. Oil Chem. Soc.	48	448-451
1973	Purification of Cyclic Fatty Acid Esters: a GC-MS Study	Perkins, E.G. and Iwaoka, W.T.	J. Am. Oil Chem. Soc.	50	44-49
1974	Studies on Peroxidative Hemolysis and Erythrocyte Fatty Acids in the Rabbit: Effect of Dietary PUFA and Vitamin E	Horn, L. R., Barker, M. O., Reed, G. and Brin, M.	J. Nutr.	104	192-201
1976	Nutritional Effects of the Cyclic monomers of Methyl Linolenate in the Rat	Iwaoka W.T. and Perkins E.G.	Lipids	11	349-353
1976	Nutrition and Metabolic Studies of Methyl Esters of Dimeric Fatty Acids in the Rat	ALEXANDER HSIEH and EDWARD G. PERKINS	LIPIDS	11	763-768
1977	Studies on the Toxicity of the Autoxidation Oils VI Comparative Toxicity of Secondary Oxidation Products in Autoxidized Methyl Linoleate	Tovar L.R. and Kaneda T.	Yukagaku	26	169-172
1978	Determination of Peroxide Value by the Colorimetric Iodine Method with Protection of Iodine as Cadmium Complex	Takagi T., Mitsuno Y. and Masumura M	Lipids	13	147-151
1979	Lipid Oxidation Products and Chick Nutritional Encephalopathy	Budowski P., Bartov I., Dror Y., and Frankel E. N.	Lipids	14	768-772
1980	Absorption of Methyl Linoleate Hydroxides in Rabbit	Nakatsugawa K and Kaneda T	Yukagaku	30	74-77
1980	A Colorimetric Microdetermination of Peroxide Values Utilizing Aluminum Chloride as the Catalyst	Asakawa T., and Mathushita S.	Lipids	15	965-967
1981	Analysis of Thermally Abused Soybean Oils for Cyclic Monomers	J.B.MELTZER, E.N.FRANKEL, T. R.BESSLER and E.G.PERKINS	JAOCS (July)		779-784
1983	Absorption and Metabolism of Methyl Linoleate Hydroperoxides in Rats	Nakatsugawa K and Kaneda T	Yukagaku	32	361-366
1984	Occurrence of Cyclic Fatty Acid Monomers in Frying Oils Used for Fast Foods	E.N.FRANKEL and L.M.SMITH, C.L.HAMBLIN, R.K. CREVELING and A.J.CLIFFORD	JAOCS	61	87-90
1986	Distribution of ¹⁴ C after Oral Administration of (U- ¹⁴ C) Labeled Methyl Linoleate Hydroperoxides and their Secondary Oxidation Products in Rats	Oarada M, Miyazawa T. and Kaneda T	Lipids	21	150-154

1986	Retardation of Rancidity in Deep-Fried Instant Noodles (Ramyon)	K.L.Rho,P.A.Seib,O.K.Chung and D.S.Chung	JAOCS	63	251-256
1988	Studies on the Concentration of Oxidized Components of Abused Fats and the Application of HPLC to their Separation	E.G.Perkins and Suzanne Pinter	JAOCS	65	783-787
1990	Suggested Mechanisms for the Production of 4-Hydroxy-2-Nonenal from the Autoxidation of Polyunsaturated Fatty Acids	Pryor W. A. and Porter N. A.	Free Radic. Biol. Med.	8	541-543
1991	The Presence of Oxidative Polymeric Materials in Encapsulated Fish Oils	Vijai K.Sshukla and Edward G perkins	LIPIDS	26	23-26
1994	Rapid Determination of Double Bond Configuration and Position Along the Hydrocarbon Chain in Cyclic Fatty Acid Monomers	M.M.Mossoba,M.P.Yurawecz,J.A.G.Roach,H.S.Lin,R.E.McDonald,B.D.Flickinger	LIPIDS	29	893-896
1995	Assessment on the Digestibility of Oxidized Compounds from [1- ¹⁴ C]Linoleic Acid Using a Combination of Chromatographic Techniques	Marquez-Ruiz G. and Dobarganes M. C.	J. Chromatogr. B	675	1-8
1996	Effects of Dietary Heated Fats on Rat Liver Enzyme Activity	Coirdjo Lamboni and Edward G.Perkins	Lipids	31	955-962
1997	The Effects of Cyclic Fatty Acid Monomers on Cultured Porcine Endothelial Cells	Brent D. Flickinger,Robert H. McCusker,Jr,and Edward G.Perkins	Lipids	32	925-933
1998	Cyclic Fatty Acid Monomers from Dietary Heated Fats Affect Rat Liver Enzyme Activity	Courdjo Lamboni,Lean-Louis Sebedio,and Edward G.Perkins	Lipids	33	675-681
2003	4-Hydroxy-2-Nonenal: a Product and Mediator of Oxidative Stress	Uchida K.	Prog. Lipid Res.	42	318-343

ISA

The International Sweeteners Association (ISA) - representing manufacturers and industrial users of high intensity sweeteners – would like to make the below comment on document ALINORM 04/27/12 Appendix XXVII “Priority List of Food Additives, Contaminants and Naturally Occurring Toxicants proposed for evaluation by JECFA”.

Aspartame acesulfame salt – revision of specifications

The Dutch delegation has proposed to correct a few errors that appear in the current specifications for aspartame acesulfame salt. **ISA fully supports the Dutch proposal to:**

- delete the text “after adjusting the pH to alkalinity” in the description of the process;
- change the text under Solubility to “Sparingly soluble in water; slightly soluble in ethanol”;
- change the number 0.643 under Specific Rotation to 0.646.

The former two points were simply entered wrongly into the JECFA specifications while the latter point was entered due to an error made by the producer of aspartame acesulfame salt; they used a slightly wrong number for the molecular weight of aspartame. Using the correct number, the end result is 0.646 and not 0.643. The producer hopes to have this corrected.

When the European Commission in September 2003 issued a draft proposal for purity criteria for aspartame acesulfame salt, it based its text on the JECFA specifications, including the errors referred to above. ISA pointed out the errors to the Commission who agreed to have them corrected in the text that was adopted on 16 April 2004 (please see Commission Directive enclosed).

ISA supports the Dutch delegations' request for the errors now to be corrected in the JECFA specifications. Our comments will also be formally submitted to JECFA upon their call for data for the 65th meeting on food additives next June.

資料 4

関連する新聞記事

ロケット試作中に爆死

クラブ活動の学生

東海大禁じられた学内で



山本君(内)がロケット試作中のロケットへしきりつけようとして爆死した。中央のロケットは別の物(計研室高橋氏の物)

東海大学工学部機械工学科の学生山本君が、学内でロケットの試作中に爆死した。山本君は、ロケットの燃料タンクにシキリ油を注ぎ、ロケットを点検していたところ、燃料タンクが破裂し、山本君は爆死した。山本君は、ロケットの試作中に爆死した。山本君は、ロケットの試作中に爆死した。

荒川取水口ほぼ完成

18日から切替え工事



荒川取水口見取図

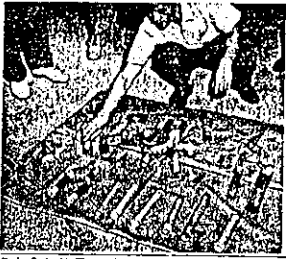
きょう通水始める 江東へ初の工業用水道

荒川取水口の建設がほぼ完了し、18日から切替え工事が始まる。これは、江東区へ初の工業用水道となる。荒川取水口の建設は、荒川の水を浄水し、工業用水として供給するものである。切替え工事は、現在の用水道から新しい取水口へ水を切り替える作業である。

湘南・千葉も高波注意

20日、21日、西日本に影響

湘南・千葉も高波注意。20日、21日、西日本に影響。気象庁は、20日、21日、西日本に高波が予想されると発表している。湘南・千葉も高波に注意が必要である。高波は、船舶の航行に危険を及ぼす可能性がある。船舶の航行には、高波に注意し、安全な航行を心がける必要がある。



正午、サイレンで祈り

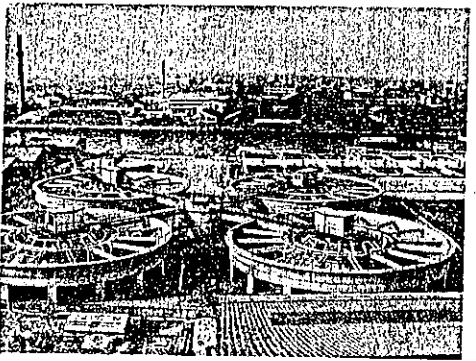
きょう全国戦没者追悼式

正午、サイレンで祈り。きょう全国戦没者追悼式。8月15日は、第二次世界大戦の終結の日であり、全国で戦没者を追悼する式典が行われる。正午には、サイレンが鳴り、国民は黙祷する。追悼式は、戦没者の冥福を祈り、平和を願うものである。

母子はさまれ死傷

三軒車場捜しの車後退

母子はさまれ死傷。三軒車場捜しの車後退。東京都で母子が巻き込まれる交通事故が発生した。母子は、三軒車場を捜している車の後退によって巻き込まれ、死傷した。事故の原因は、車の後退によるものである。事故の発生は、母子の安全を脅かしている。



江東地区に二重用水路を供給する荒川取水口完成工事(荒川取水口建設中)

二重の人工 降用済海堀

二重の人工。降用済海堀。荒川取水口の建設には、二重の人工が活用されている。降用済海堀は、建設現場で発生した土砂を再利用するための技術である。この技術は、環境に優しい建設方法として注目されている。

Real estate advertisement for '別荘' (villa) with details on location and price.

Advertisement for '明日を築こう!' (Build tomorrow!) featuring '足利銀行' (Asahi Bank).

Advertisement for '山谷ひとみ' (Yamaguchi Hitomi) and '高橋の拘束' (Takahashi's restraint).

Advertisement for 'YASHICA' cameras, featuring the 'リナックス5000' (Linax 5000) model.

Advertisement for '信越ポリマー株式会社' (Shinetsu Polymer Co., Ltd.) with contact information.

Advertisement for 'マルマン' (Maruman) recruitment, titled '文化生活に貢献する最高の仕事!' (Best job contributing to cultural life!).

Advertisement for '京浜倉庫' (Keihin Warehouse) recruitment, listing various job positions.

Advertisement for '信越ポリマー株式会社' (Shinetsu Polymer Co., Ltd.) recruitment, listing various job positions.

Advertisement for '馬場名義' (Utsunomiya Naonori) recruitment, listing various job positions.

Advertisement for '御会葬' (Funeral service) for a deceased individual.

Advertisement for '鎌倉光明寺 高級分譲地' (Kamakura Komyo-ji High-class land sale) with details on the property.

Advertisement for '社員募集' (Recruitment) for a company, listing various job positions.

Advertisement for '日産自動車' (Nissan) recruitment, listing various job positions.

II. 分担研究報告

なし

III. 研究成果の刊行に関する一覧表

著者氏名	論文タイトル名	書籍全体の 編集者名	書 籍 名	出版社名	出版地	出版年	ページ
和田 俊 後藤直宏			食品機能学 脂質	丸善株式 会社	東京	2004	1-227

雑誌

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
N. Gotoh, A. Iwasawa, J. Yokota. And S. Wada	Distribution of proxide value and acid value in instant noodles collected in the commercial market of the world.	J. Food Process. Pres.			2004 (submitting)
N. Gotoh, H. Watanabe, R. Osato, A. Iwasawa, K. Inagaki and S. Wada	New sght on the pssibility of the nurotoxic bhavior afected by the oidized cmpounds in fts and ols	J. Oleo Sci.			2005 (printing)
N. Gotoh, H. Watanabe, R. Osato, A. Iwasawa, K. Inagaki and S. Wada	Novel approach on the risk assessment of oxidized fats and oils for perspectives of food safety and quality (I) - Oxidized fats and oils induces neurotoxicity relating pica behavior and hypoactivity -	Food Chem. Toxicol.			2005 (submitting)
N. Gotoh, H. Watanabe, R. Osato, A. Iwasawa, K. Inagaki and S. Wada	Novel approach on the risk assessment of oxidized fats and oils for perspectives of food safety and quality (II) - Sub acute toxicity test with oxidized fats and oils -	Food Chem. Toxicol.			2005 (submitting)
N. Gotoh, H. Watanabe, R. Osato, A. Iwasawa, K. Inagaki and S. Wada	Variation of factors on oxidation of fats and oils in processed food stored under several kinds of conditions				2005 (preparing)
N. Gotoh, H. Watanabe, R. Osato, A. Iwasawa, K. Inagaki and S. Wada	Review: Toxicity of oxidized fats and oils				2005 (preparing)

IV. 研究成果の刊行物・別刷
分冊(2/2)に掲載した。