

## 第6回汚染物質専門調査会議事次第

### 1. 日時及び場所

平成16年10月19日（火） 9：30～  
食品安全委員会7階大会議室

### 2. 出席委員（11名）五十音順

安藤 正典（あんどう まさのり）  
井口 弘（いぐち ひろし）  
大前 和幸（おおまえ かずゆき）  
香山 不二雄（かやま ふじお）  
川村 孝（かわむら たかし）  
佐藤 洋（さとう ひろし）  
菅原 和夫（すがわら かずお）  
津金 昌一郎（つがね しょういちろう）  
遠山 千春（とおやま ちはる）  
富永 祐民（とみなが すけたみ）  
前川 昭彦（まえかわ あきひこ）

#### 【今回欠席の委員（1名）】

千葉 百子（ちば ももこ）

### 3. 議 事

- (1) 魚介類等に含まれるメチル水銀について
- (2) その他

## 汚染物質専門調査会専門委員名簿（五十音順）

- 安藤 正典 (武藏野大学 薬学部 教授 (環境衛生学教室) )
- 井口 弘 (兵庫医科大学 教授 (衛生学教室) )
- 大前 和幸 (慶應義塾大学 医学部 教授 (衛生学公衆衛生学教室) )
- 香山 不二雄 (自治医科大学 地域医療学センター 環境医学部門 教授)
- 川村 孝 (京都大学 保健管理センター所長・教授)
- 佐藤 洋 (東北大学大学院 医学系研究科 社会医学講座 環境保健医学分野  
教授)
- 菅原 和夫 (医療法人 慈仁会 尾野病院 医院長)
- 千葉 百子 (順天堂大学 医学部 衛生学 助教授)
- 津金 昌一郎 (国立がんセンター がん予防・検診研究センター 予防研究部長  
(兼) 同研究所支所 臨床疫学研究部長)
- 遠山 千春 (独立行政法人 国立環境研究所 環境健康研究領域長)
- 富永 祐民 (財団法人 愛知県健康づくり振興事業団 健康科学総合センター長)
- 前川 昭彦 (財団法人 佐々木研究所 所長)

## 配布資料一覧

〈 配布資料 〉

メチル水銀諮詢資料

1) 資料1～資料65

2) 資料66～資料85

# 魚介類等に含まれるメチル水銀に係る食品健康影響評価について

## <資料一覧>

### 厚生労働省提出資料

資料 No.1 FAO/WHO 合同食品添加物専門家会議(JECFA)サマリーレポート

- No.1-1 第 16 回
- No.1-2 第 22 回
- No.1-3 第 33 回
- No.1-4 第 53 回
- No.1-5 第 61 回
- No.1-6 WHO-Technical Report Series-922 (抜粋)

資料No.2 WHO環境保健クライテリア (EHC) 101

資料 No.3 国連環境計画 (UNEP) Global Mercury Assessment

資料 No.4 平成 15 年度 メチル水銀のリスク評価のための文献収集報告書

資料 No.5-1 薬事・食品衛生審議会食品衛生分科会乳肉水産食品・毒性合同部会配付資料(平成 15 年 6 月 3 日開催)

No.5-2 平成 16 年 8 月 17 日薬事・食品衛生審議会食品衛生分科会乳肉水産食品部会資料

資料No.6 Axtell CD, Myers GJ, Davidson PW, et al. - Semiparametric modeling of age at achieving developmental milestones after prenatal exposure to methylmercury in the Seychelles child development study. *Environ Health Perspect.* 1998;106(9):559-563.

資料No.7 Axtell C, C C, GJ M, et al. - Association between methylmercury exposure from fish consumption and child development at five and a half years of age in the Seychelles Child Development Study: an evaluation of nonlinear relationships. *Environ Res.* 2000;84(2):71-80.

資料No.8 Budtz-Jorgensen E, Grandjean P, Keiding N, White RF, Weihe P. - Benchmark dose calculations of methylmercury-associated neurobehavioural deficits. *Toxicol Lett.* 2000;113:193-199.

資料No.9 Cernichiari E, Toribara TY, Liang L, et al. - The biological monitoring of mercury in the Seychelles study. *Neurotoxicology.* 1995;16(4):613-628.

資料No.10 Clarkson T, Cox C, Davidson PW, Myers GJ. - Mercury in fish. *Science.* 1998;279(5350):461.

資料No.11 Crump KS, Van Landingham C, Shamlaye C, et al. - Benchmark concentrations for methylmercury obtained from the Seychelles Child Development Study. *Environ Health Perspect.* 2000;108(3):257-263.

資料No.12 Davidson PW, Myers GJ, Cox C, et al. - Longitudinal neurodevelopmental study of Seychellois children following in utero exposure to methylmercury from maternal fish ingestion: outcomes at 19 and 29 months. *Neurotoxicology.*

1995;16(4):677-688.

資料No.13 Davidson PW, Myers GJ, Cox C, et al. - Neurodevelopmental test selection, administration, and performance in the main Seychelles child development study. *Neurotoxicology*. 1995;16(4):665-676.

資料No.14 Davidson PW, Myers GJ, Cox C, et al. - Effects of prenatal and postnatal methylmercury exposure from fish consumption on neurodevelopment: outcomes at 66 months of age in the Seychelles Child Development Study. *Jama*. 1998;280(8):701-707.

資料No.15 Davidson PW, Myer GJ, Shamlaye C, et al. - Association between prenatal exposure to methylmercury and developmental outcomes in Seychellois children: effect modification by social and environmental factors. *Neurotoxicology*. 1999;20(5):833-841.

資料No.16 Davidson PW, Palumbo D, Myers GJ, et al. - Neurodevelopmental outcomes of Seychellois children from the pilot cohort at 108 months following prenatal exposure to methylmercury from a maternal fish diet. *Environ Res*. 2000;84(1):1-11.

資料No.17 Davidson PW, Kost J, Myers GJ, Cox C, Clarkson TW, Shamlaye CF. - Methylmercury and neurodevelopment: reanalysis of the Seychelles Child Development Study outcomes at 66 months of age. *JAMA*. 2001;285(10):1291-1293.

資料No.18 Deborah C. Rice - The US EPA reference dose for methylmercury: sources of uncertainty. *Environmental Research* 95 (2004) 406- 413.

資料No.19 Donald C.Cole, Jill Kearney, Luz Helena Sanin, Alain Leblanc, and Jean Phillippe Weber - Blood mercury levels among Ontario anglers and sport-fish eaters. *Environmental Research* 95 (2004) 305-314.

資料No.20 Esben Budtz-Jorgensen, Philippe Grandjean, Poul J. Jorgensen, Pal Weihe and Niels Keiding - Association between mercury concentrations in blood and hair in methylmercury-exposed subjects at different ages. *Environmental Research* 95 (2004) 385- 393.

資料No.21 Grandjean P, Weihe P, Jorgensen PJ, Clarkson T, Cernichiari E, Videro T. - Impact of maternal seafood diet on fetal exposure to mercury, selenium, and lead. *Arch Environ Health*. 1992;47(3):185-195.

資料No.22 Grandjean P, Nielsen GD, Jorgensen PJ, Horder M. - Reference intervals for trace elements in blood: significance of risk factors. *Scand J Clin Lab Invest*. 1992;52(4):321-337.

資料No.23 Grandjean P, Weihe P. - Neurobehavioral effects of intrauterine mercury exposure: potential sources of bias. *Environ Res*. 1993;61(1):176-183.

資料No.24 Grandjean P, Weihe P, Nielsen JB. - Methylmercury: significance of intrauterine and postnatal exposures. *Clin Chem*. 1994;40(7 Pt 2):1395-1400.

資料No.25 Grandjean P, Weihe P, Needham LL, et al. - Relation of a seafood diet to mercury, selenium, arsenic, and polychlorinated biphenyl and other organochlorine concentrations in human milk. *Environ Res*. 1995;71(1):29-38.

資料No.26 Grandjean P, White RF, Weihe P. - Neurobehavioral epidemiology: application in risk assessment. *Environ Health Perspect*. 1996;2:397-400.

資料No.27 Grandjean P, Weihe P, White RF, et al. - Cognitive deficit in 7-year-old children with prenatal exposure to methylmercury. *Neurotoxicol Teratol*. 1997;19(6):417-428.

- 資料No.28 Grandjean P, Weihe P, White RF, Debes F. - Cognitive performance of children prenatally exposed to "safe" levels of methylmercury. *Environ Res.* 1998;77(2):165-172.
- 資料No.29 Grandjean P, Weihe P. EDITORIAL·A New Era of Mercury Hazards-. *Environmental Research, Section A.* 1998;77:67.
- 資料No.30 Grandjean P, White RF. - Effects of methylmercury exposure on neurodevelopment. *Jama.* 1999;281(10):897.
- 資料No.31 Grandjean P, Bjerve KS, Weihe P, Steuerwald U. - Birthweight in a fishing community: significance of essential fatty acids and marine food contaminants. *Int J Epidemiol.* 2001;30(6):1272-1278.
- 資料No.32 Grandjean P, RF W, K S, et al. - Impact of contrast sensitivity performance on visually presented neurobehavioral tests in mercury-exposed children. *Neurotoxicol Teratol.* 2001;23(2):141-146.
- 資料No.33 Grandjean P, Weihe P, Burse VW, et al. - Neurobehavioral deficits associated with PCB in 7-year-old children prenatally exposed to seafood neurotoxicants. *Neurotoxicol Teratol.* 2001;23(4):305-317.
- 資料No.34 Grandjean P, Budtz-Jorgensen E, Steuerwald U, et al. - Attenuated growth of breast-fed children exposed to increased concentrations of methylmercury and polychlorinated biphenyls. *Faseb J.* 2003;17(6):699-701.
- 資料No.35 Grandjean P, Murata K, Budtz-Jorgensen E, Weihe P. - Cardiac autonomic activity in methylmercury neurotoxicity: 14-year follow-up of a Faroese birth cohort. *J Pediatr.* 2004;144(2):169-176.
- 資料No.36 H.A. Anderson, L.P. Hanrahan, A. Smith, L. Draheim, M. Kanarek, and J. Olsen - The role of sport-fish consumption advisories in mercury risk communication: a 1998-1999 12-state survey of women age 18-45, Environmental Research 95 (2004) 315-324
- 資料No.37 Huang L-S, Cox C, Wilding GE, et al. - Using measurement error models to assess effects of prenatal and postnatal methylmercury exposure in the Seychelles Child Development Study. *Environ Res.* 2003;93(2):115-122.
- 資料No.38 I. Michael Weis - Mercury concentrations in fish from Canadian Great Lakes areas of concern: an analysis of data from the Canadian Department of Environment database. Environmental Research 95 (2004) 341- 350.
- 資料No.39 Joelle Morissette, Larissa Takser, Genevieve St-Amour, Audrey Smargiassi, Jukie Lafond, and Donna Mergler - Temporal variation of blood and hair mercury levels in pregnancy in relation to fish consumption history in a population living along the St. Lawrence River. Environmental Research 95 (2004) 363- 374.
- 資料No.40 John A. Dellingen - Exposure assessment and initial intervention regarding fish consumption of tribal members of the Upper Great Lakes Region in the United States. Environmental Research 95 (2004) 325- 340.
- 資料No.41 Julshamn K, Andersen A, Ringdal O, Morkore J. - Trace elements intake in the Faroe Islands. I. Element levels in edible parts of pilot whales (*Globicephalus meleanus*). *Sci Total Environ.* 1987;65:53-62.
- 資料No.42 Kathryn R. Mahaffey - Fish and shellfish as dietary sources of

methylmercury and the  $\omega\cdot3$  fatty acids, eicosahexaenoic acid and docosahexaenoic acid: risks and benefits. *Environmental Research* 95 (2004)414- 428.

資料No.43 Keiding N, Budtz-Jorgensen E, Grandjean P. - Prenatal methylmercury exposure in the Seychelles. *Lancet*. 2003;362(9384):664-665.

資料No.44 Landrigan PJ, Goldman L. - Prenatal methylmercury exposure in the Seychelles. *Lancet*. 2003;362(9384):666-667

資料No.45 Lapham LW, Cernichiari E, Cox C, et al. - An analysis of autopsy brain tissue from infants prenatally exposed to methymercury. *Neurotoxicology*. 1995;16(4):689-704.

資料No.46 Lyketsos CG. - Should pregnant women avoid eating fish? Lessons from the Seychelles. *Lancet*. 2003;361(9370):1667-1668.

資料No.47 Marsh DO, Clarkson TW, Myers GJ, et al. - The Seychelles study of fetal methylmercury exposure and child development: introduction. *Neurotoxicology*. 1995;16(4):583-596.

資料No.48 Matthews AD. - Mercury content of commercially important fish of the Seychelles, and hair mercury levels of a selected part of the population. *Environ Res*. 1983;30(2):305-312.

資料No.49 Michael Gilbertson – Male cerebral palsy hospitalization as a potential indicator of neurological effects of methylmercury exposure in Great Lakes communities. *Environmental Research* 95 (2004) 375- 384.

資料No.50 Murata K, Weihe P, Araki S, Budtz-Jorgensen E, Grandjean P. - Evoked potentials in Faroese children prenatally exposed to methylmercury. *Neurotoxicol Teratol*. 1999;21(4):471-472.

資料No.51 Murata K, Dakeishi M. - [Impact of prenatal methylmercury exposure on child neurodevelopment in the Faroe Islands]. *Nippon Eiseigaku Zasshi*. 2002;57(3):564-570.

資料No.52 Murata K, Weihe P, Budtz-Jorgensen E, Jorgensen PJ, Grandjean P. - Delayed brainstem auditory evoked potential latencies in 14-year-old children exposed to methylmercury. *J Pediatr*. 2004;144(2):177-183.

資料No.53 Myers GJ, Davidson PW, Cox C, et al. - Summary of the Seychelles child development study on the relationship of fetal methylmercury exposure to neurodevelopment. *Neurotoxicology*. 1995;16(4):711-716.

資料No.54 Myers GJ, Marsh DO, Davidson PW, et al. - Main neurodevelopmental study of Seychellois children following in utero exposure to methylmercury from a maternal fish diet: outcome at six months. *Neurotoxicology*. 1995;16(4):653-664.

資料No.55 Myers GJ, Davidson PW, Cox C, et al. - Neurodevelopmental outcomes of Seychellois children sixty-six months after in utero exposure to methylmercury from a maternal fish diet: pilot study. *Neurotoxicology*. 1995;16(4):639-652.

資料No.56 Myers GJ, Marsh DO, Cox C, et al. - A pilot neurodevelopmental study of Seychellois children following in utero exposure to methylmercury from a maternal fish diet. *Neurotoxicology*. 1995;16(4):629-638.

資料No.57 Myers GJ, Davidson PW, Shambaye CF, et al. - Effects of prenatal methylmercury exposure from a high fish diet on developmental milestones in the

- Seychelles Child Development Study. *Neurotoxicology*. 1997;18(3):819-829.
- 資料No.58 Myers GJ, Davidson PW, Palumbo D, et al. - Secondary analysis from the Seychelles Child Development Study: the child behavior checklist. *Environ Res*. 2000;84(1):12-19.
- 資料No.59 Myers GJ, Davidson PW, Cox C, et al. - Prenatal methylmercury exposure from ocean fish consumption in the Seychelles child development study. *Lancet*. 2003;361(9370):1686-1692.
- 資料No.60 Palumbo DR, Cox C, Davidson PW, et al. - Association between prenatal exposure to methylmercury and cognitive functioning in Seychellois children: a reanalysis of the McCarthy Scales of Children's Ability from the main cohort study. *Environ Res*. 2000;84(2):81-88.
- 資料No.61 Rice DC. - Identification of functional domains affected by developmental exposure to methylmercury: Faroe islands and related studies. *Neurotoxicology*. 2000;21(6):1039-1044.
- 資料No.62 Shamlaye CF, Marsh DO, Myers GJ, et al. - The Seychelles child development study on neurodevelopmental outcomes in children following in utero exposure to methylmercury from a maternal fish diet: background and demographics. *Neurotoxicology*. 1995;16(4):597-612.
- 資料No.63 Sorensen N, Murata K, Budtz-Jorgensen E, Weihe P, Grandjean P. - Prenatal methylmercury exposure as a cardiovascular risk factor at seven years of age. *Epidemiology*. 1999;10(4):370-375.
- 資料No.64 Steuerwald U, Weihe P, Jorgensen PJ, et al. - Maternal seafood diet, methylmercury exposure, and neonatal neurologic function. *J Pediatr*. 2000;136(5):599-605.
- 資料 No.65 Weihe P. - Prenatal methylmercury exposure in the Seychelles. *Lancet*. 2003;362(9384):666-667.
- 資料No.66 ATSDR(US). TOXICOLOGICAL PROFILE FOR MERCURY. Available at: <http://www.atsdr.cdc.gov/toxprofiles/tp46.pdf>. Accessed Jan 7, 2004.
- 資料No.67 NRC CotTEoM. *Toxicological Effects of Methylmercury*. Washington,DC: National Academy Press; 2000.
- 資料 No.68 S.Allen Counter and Leo H.Buchanan -Mercury exposure in children: a review. *Toxicology and Applied Pharmacology* 198(2004)209-230
- 資料 No.69 Bakir, F., S.F.Damluji, L.Amin-Zaki, M.Murtadha, A. Khalidi. Al-rawi, S.Tikriti, H.I.Dahahir, T.W.Clarkson,J.C.Smith and R.A.Doherty: Methylmercury poisoning iraq. *Science* 181 :230-241, 1973.
- 資料 No.70 Clarkson, T. W. (2002). The three modern faces of mercury. *Environ. Health Perspect*. 110(suppl.1):11-23
- 資料 No.71 Crump KS, Kjellstrom T, Shipp AM, Silvers A, Stewart A. - Influence of prenatal mercury exposure upon scholastic and psychological test performance: benchmark analysis of a New Zealand cohort. *Risk Anal*. 1998;18(6):701-713.
- 資料No.72 Kjellstrom T, P. Kennedy, S.Wallis and C.Mantell : Physical and mental

development of children with prenatal exposure to mercury from fish.

Stage1:Preliminary test at age 4. *National Swedish Environmental Protection Board, Report 308 Solna, Swedish* 1986.

資料No.73 Kjellstrom T, P. Kennedy, S.Wallis and C.Mantell : Physical and mental development of children with prenatal exposure to mercury from fish.

Stage2:Interviews and psychological tests at age 6. *National Swedish Environmental Protection Board, Report 3642 Solna, Swedish* 1989.

資料 No.76. Friberg, L(Swedish Expert Group).1971. methylmercury in fish: A toxicological-epidemiologic evaluation of risk report from an expert group. *Nord.Hyg.Tidskr.4(Suppl.):19-364*

資料 No.77. Tsubaki, T., Hirota, K., Shirakawa, K., Kondo,K., & Sato, T.(1978) Clinical, epidemiological and toxicological studies on methylmercury poisoning. In: Plaa, G.L.& Duncan, W.A.M., ed. *Proceedings of the First International congress on Toxicology*, New York, London, San Francisco, Academic Press, pp.339-357.

資料 No.78. Marsh, D.O., T.W.Clarkson,.C.Cox, G.J.Myers, L.Amin-Zaki and S.Al-Tikriti: Fetal methylmercury poisoning. Relationship between concentration in single strands of maternal hair and children effects. *Archives of neurology* 44:1017-1022, 1987

資料 No.79. Amin-Zaki, I., Majeed, M. A. , Greenwood, M.R. ,Elhassani, S.B.,Clarkson,T.W. and Doherty, R.A.(1981). Methylmercury poisoning in the Iraqi suckling infant: a longitudinal study over five years. *J. Appl Toxicol.1(4):210-214*

資料 No.80. Sakamoto M, et al: Declining risk of methylmercury expose to infants during lactation, *Environ Res*, 90, 185-189, 2002.

## 事務局収集資料

資料 No.74 EPA(U.S. Environmental Protection Agency).2000.Methylmercury(MeHg) CASRN22967-92-6.U.S. Environmental Protection Agency IRIS Substance file. [Online].Available :<http://www.epa.gov/iris/subst/0073.htm> : Last updated:9 July 2004

資料 No.75 喜田村正次 近藤雅臣 瀧澤行雄 藤井正美 藤木素士 共著 「水銀」 講談社サイエンティフィク (1976) (抜粋: P366~P372)

資料No.81. Kazuko Yoshizawa, Sc.D., Eric B. Rimm, Sc.D., J. Steven Morris, Ph.D., Vickie L. Spate, Chung-cheng Hsieh, Sc.D., Donna Spiegelman, Sc.D., Meir J. Stampfer, M.D., and Walter C. Willett, M.D.(Department of Nutrition, Harvard School of Public Health, Boston, USA. Mercury and the Risk of Coronary Heart Disease in Men. *New England Journal of Medicine*, 2002, Nov 28;347(22):1755-60

資料 No.82. Julie L.Daniels,Matthew P.Longnecker,Andrew S.Roland et al. Fish

Intake During Pregnancy and Early Cognitive Development of Offspring,  
Epidemiology, 15, 394-402, 2004.

資料 No.83. Hugh H.Harris,Ingrid J.Pickering,Graham N.George. The Chemical  
Form of Mercury in Fish.Science ,2003,Aug 29;vol.301:1203

資料 No.84. 岡知子・仲井邦彦・亀尾聰美・佐藤洋.セイシェル共和国における水銀と健康の  
問題.環境科学会誌.17(3):163-168(2004)

資料 No.85. 村田勝敬・嶽石美和子・岩田豊人.フェロー諸島における出生コホート研究.環境  
科学会誌.17(3):169-180(2004)