PUBLIC HEALTH

Dietary intake and health effects of selected toxic elements 2
The improvement on extraction and purification of dioxins in human blood. The dioxins concentration in the blood of Yusho patients 2
Follow-up survey of dioxins concentrations in the blood of Yusho patients in 2002-2003 2
Effect of environmental lead exposure on time to pregnancy of newly-married women 3
Exposure of children to deet and other topically applied insect repellents 3
Development in the knowledge of thiaminase and related health hazards 3
Nature, cause, and control of irradiation-induced off-odor in ready-to-eat meat products 4
Determinants of exposure to volatile organic compounds in four Oklahoma cities 4
Personal exposures to VOC in the upper end of the distribution-relationships to indoor, outdoor and workplace concentrations 5
In-flight spraying in aircrafts: determination of the exposure scenario 5
Quality of ice manufactured in Karachi City 6
Water arsenic exposure and children’s intellectual function in Araihazar, Bangladesh 6
Physico-chemical studies of fluoride in ground water of Patan region (Gujarat) 6
Dietary intake and health effects of selected toxic elements
2005-10-04
Anthropogenic activities have been contributing to the spread of toxic chemicals into the environment, including several toxic metals and metalloids, increasing the levels of human exposure to many of them. Contaminated food is an important route of human exposure and may represent a serious threat to human health. This mini review covers the health effects caused by toxic metals, especially Cd, Hg, Pb and As, the most relevant toxic elements from a human health point of view.
Authors: Oliveira da Silva, Andre Luiz; Barrocas, Paulo R. G.; do Couto Jacob, Silvana; Moreira, Josino Costa
Full source: Brazilian Journal of Plant Physiology 2005, 17(1), 79-93 (Eng)

The improvement on extraction and purification of dioxins in human blood. The dioxins concentration in the blood of Yusho patients
2005-10-04
Authors had developed quantitative determination method of polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and coplanar polychlorinated biphenyls (Co-PCBs) in 5 mL blood of Yusho patients. Mean concentration of toxic equivalent quantitative (TEQ) of 78 patients in 2001, 279 patients in 2002 and 260 patients in 2003 was 179.3, 136.4 and 125.0 pg-TEQ/g lipid, respectively. These values were 3-5 times higher than those of healthy subjects. The concentration of PCDFs of patients in each year was 13.8 (2001), 10.3 (2002) and 9.5 (2003) times higher than those of healthy subjects. The ratio of PCDFs in Yusho patients was about 80% to total related substances (PCDDs, PCDFs, Co-PCBs and the like). Concentration of PCDFs, esp. 2,3,4,7,8-PeCDF, was 16.8, 12.6 and 11.6 times higher than that of healthy subject in 2001, 2002 and 2003, respectively. Thus, 2,3,4,7,8-PeCDF could be the key compound for establishment of diagnostic criteria of Yusho.
Authors: Todaka, Takashi; Hirakawa, Hironori; Hori, Tsuguhide; Tobiishi, Kazuhiro; Iida, Takao
Full source: Fukuoka Igaku Zasshi 2005, 96(5), 185-191 (Japan)

Follow-up survey of dioxins concentrations in the blood of Yusho patients in 2002-2003
2005-10-04
Authors measured the concentrations of polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and non-ortho-coplanar polychlorinated biphenyls (Co-PCBs) in blood collected from 279 Yusho patients and 92 Yusho-suspected persons living in Japan in 2002, 269 Yusho patients and 74 Yusho-suspected persons living in Japan in 2003 and 128 normal controls living in Fukuoka Prefecture, and compared with the concentrations of these compounds among the groups. Yusho patients indicated the highest concentrations ratio of PCDFs to the total TEQ concentrations. Moreover, of the PCDFs congeners for Yusho patients, the concentrations of 2,3,4,7,8-TeCDF were about 11.0 times and 10.1 times higher in 2002 and 2003 than those in normal controls. These results indicated that Yusho patients have a much higher concentration of 2,3,4,7,8-TeCDF in their blood than do unaffected persons even though over 34 years have passed since the outbreak of Yusho.
Authors: Todaka, Takashi; Hirakawa, Hironori; Hori, Tsuguhide; Tobiishi,
Effect of environmental lead exposure on time to pregnancy of newly-married women
2005-10-04
This study examines the effect of environmental lead exposure on time to pregnancy (time to pregnancy, TTP) of newly-married women. Geometric mean of 210 women blood lead levels was 62.71±2.18 mug/L, means of TTP was 2.95 menstrual cycles, the fecundity was decreased with the TTP prolonged. The distribution of TTP between high and low lead groups of blood was significant different. Cox regression analysis showed two group fecundability ratio (FR) was 0.626, the difference was significant. The result of the present paper indicated that fecundity decreased when the blood lead level of women was not less than 100 mug/L. Environmental lead exposure has an adverse effect on TTP.
Authors: Shen, Tong; Zhu, Zhong-ping; Yang, Yong-jian; Hu, Chuan-lai; Xu, Qiu-yue; Guo, Zhi-yong; Yu, Cui-lian; Zou, Wu-qing; Liu, Jun-ling; Jiang, Yu-ping; Zhu, Qi-xing
Full source: Huanjing Yu Jiankang Zazhi 2005, 22(2), 83-86 (Ch)

Exposure of children to deet and other topically applied insect repellents
2005-10-04
In the summer of 2002, a cross-sectional survey on the use patterns of repellents on children and possible associated effects was conducted in Maryland campgrounds. Information requested included products used, details of applications, post-application practices, and parents’ decision-making process. The study yielded 301 respondents. Deet was the most commonly used active ingredient (83.4%); aerosols were the most common formulation (42.5%). Over 1/3 of subjects (38.9%) treated their children’s clothing as well as their skin. Over 1/2 of the children did not remove the repellent before going to bed. More than 1/3 of parents failed to read or follow label directions. This study provides documentation of practices leading to undesirable exposure. Educational outreach to change parents’ usage patterns is indicated.
Authors: Menon, Kalapurakkal S.; Brown, Amy E.

Development in the knowledge of thiaminase and related health hazards
2005-10-04
Entomolecular thiaminase was found recently in an African silk worm Anaphe species. A human health hazard in Nigerians causing an acute seasonal ataxia and impaired consciousness is inferred to be the result of this thiaminase. Thiaminase is also causing serious economical loss in fishery resources. Unfortunately, the meaning of this enzyme in cell biology is still unknown. Authors: Nishimune, Takahiro
Full source: Recent Research Developments in Nutrition 2002, 5, 151-167 (Eng)
Nature, cause, and control of irradiation-induced off-odor in ready-to-eat meat products

2005-10-04

Ionizing radiation improves food safety and extends shelf life by inactivating food-borne pathogens and spoilage microorganisms commonly found in ready-to-eat (RTE) meat products. However, irradiation may induce the development of an off-odor, particularly at high doses. The off-odor has been called “irradiation odor” and described as “sulfide”, “wet dog”, and “barbecued corn-like”. Although the exact compounds responsible for the off-odor are not completely clear, substantial evidences suggest that volatile sulfur compounds (VSCs) play an important role in the development of the off-odor. Many sulfur compounds, induced by irradiation, have low odor thresholds. These compounds include hydrogen sulfide, methanethiol (MT), Me sulfide, di-Me disulfide and di-Me trisulfide. In comparison, thermal processing (heating and microwave) mainly induced MT and Et Me sulfide. VSCs were presumably synthesized from sulfur containing compounds (such as methionine, cysteine, thiamine, glutathione) reacting with free radicals generated from water radiolysis. Antioxidants applied either as ingredients in raw meat emulsions prior to RTE manufacture or as post-manufacture dipping did not consistently reduce VSCs formation caused by irradiation.

Authors: Fan, Xuetong

Full source: ACS Symposium Series 2005, 905(Process and Reaction Flavors), 208-221 (Eng)

Determinants of exposure to volatile organic compounds in four Oklahoma cities

2005-10-04

To begin to develop generalized models for estimating personal exposure to ambient air pollutants within diverse populations, the design of the Oklahoma Urban Air Toxics Study incorporated 8 dichotomous macroenvironmental and household factors that were hypothesized to be potential determinants of exposure. Personal, indoor, and outdoor samples of volatile organic compounds were collected over 24-h monitoring periods in 42 households, together with activity diaries and data on the participants’ residences. The distributions of the VOC concentrations were moderately to highly left-censored, and were mostly bimodal. The ATSDR minimal risk level (MRL) was exceeded in a small number of the samples. Personal and indoor concentrations tended to be higher than outdoor concentrations, indicating that indoor exposures were dominated by indoor sources. However, indoor concentrations were not correlated with the permeability of the residence, suggesting that the observed indoor concentrations reflected mostly localized, short-term emissions. The influence of the 8 dichotomous factors and of the presence of an attached garage was evaluated using the Wilcoxon rank-sum test and by comparison of “excursion fractions”, i.e., the fractions of each distributions exceeding 10% of the MRL. Dry weather and absence of children in the household were found to be associated with higher exposures in personal or indoor exposures. Given the small sample size, it is possible that these factors were confounded with unidentified household characteristics or activities that were the true determinants of exposure.

Authors: Phillips, Margaret L.; Esmen, Nurtan A.; Hall, Thomas A.; Lynch, Robert

Evaluation of participants with personal exposures above median levels in the EXPOLIS study in Athens, Helsinki, Oxford and Prague illustrated that these participants frequently showed a different relationship to indoor and workplace levels than that shown by the population median. Thus, prioritization of environments for control measures based on median exposures may exclude important areas where effectively focused control measures are possible, and may therefore have little impact on the highest and most harmful exposures. Further, personal exposures at the upper end of the distribution may exceed the US EPA inhalation reference concentration (Rfc), illustrated here using hexane, naphthalene and benzene. For example upper 90th percentile personal exposures to benzene in Athens and Prague were 64 and 27 μg m⁻³ with peak exposures of 217 and 38 μg m⁻³, respectively for non-ETS exposed participants relative to an Rfc of 30 μg m⁻³. Strategies to reduce exposures to individual compounds, therefore, may benefit from focus on the high end of the distribution to identify activities and behaviors that result in elevated exposures. Control strategies targeting activities that lead to exposures in the upper end of the distribution would reduce the variability associated with population median values by bringing the upper end of the exposure distribution closer to median values. Thus, compliance with health-based standards would be more protective of the higher exposed fraction of the population, in whom health effects would be more expected.

Authors: Edwards, Rufus D.; Schweizer, Christian; Jantunen, Matti; Lai, Hak Kan; Bayer-Oglesby, Lucy; Katsouyanni, Klea; Nieuwenhuijsen, Mark; Saarela, Kristiina; Sram, Radim; Kuenzli, Nino
Full source: Atmospheric Environment 2005, 39(12), 2299-2307 (Eng)

Exposure measurements were made in parked aircraft during and after application of a biocide aerosol spray (simulated in-flight spraying). The aerosol product SRA spray (standard reference aerosol spray) was used for spraying. Concentrations of active ingredient pyrethrins in the passenger cabin air were 11-65 μg/m³; those of the synergist, piperonyl butoxide, were 200-485 μg/m³. Concentrations on cabin furniture surfaces differed widely. Low concentrations were determined on vertical position surfaces, while under and on seats and on headrests, concentrations were <= 55.5 ng/cm² for pyrethrins and 1162.5 ng/cm² for piperonyl butoxide. Inhaled doses for spray applicators and persons sitting in the passenger cabin were calculated to be 17 μg for pyrethrins and 200 μg for piperonyl butoxide. Maximum total external body doses for spray applicators during spraying were 830 μg for pyrethrins and 8840 μg for piperonyl butoxide. The potential dermal dose for persons sitting in the passenger cabin was about a factor of 2 lower.

Authors: Berger-Preiss, Edith; Koch, Wolfgang; Behnke, Wolfgang; Gerling, Susanne; Kock, Heiko; Elflein, Lutz; Appel, Klaus E.
Full source: International Journal of Hygiene and Environmental Health 2004, 207(5), 419-430 (Eng)
Quality of ice manufactured in Karachi City
2005-10-04

The production of ice being sold in the local market of Karachi is neither regulated nor its quality and safety for human consumption is evaluated. This investigation examined the physico-chemical and bacteriological characteristics of 50 ice samples collected from different areas of Karachi city. The water being used for ice manufacturing is of poor quality, almost all the samples were found unsafe as per WHO guidelines for safe drinking water; total bacterial count exceeded the upper limit 100 CFU/mL, forty one samples out of fifty had high coliform and fecal coliform counts. The ice produced in the city by commercial manufacturers is of very poor microbiological quality and its consumption pose an immediate threat to public health. The potential for disease exists in the ice industry of Pakistan which demands special need for the implementation of appropriate remedial measures to ensure that ice produced and sold in the market is safe for human consumption.

Authors: Mahmood, S. Naeem; Usmani, Tanzil H.; Sultana, Liaquat; Siddiqui, Ishratullah; Khan, Farooq Ahmed


Water arsenic exposure and children’s intellectual function in Araihazar, Bangladesh
2005-10-04

Exposure to arsenic has long been known to have neurological consequences in adults, but to date there are no well-controlled studies in children. Authors report results of a cross-sectional investigation of intellectual function in 201 children 10 years of age whose parents participate in the ongoing prospective cohort study examining health effects of As exposure in 12,000 residents of Araihazar, Bangladesh. Exposure to As from drinking water was associated with reduced intellectual function after adjustment for sociodemographic covariates and water Mn. Water As was associated with reduced intellectual function, in a dose-response manner, such that children with water As levels > 50 mug/L achieved significantly lower Performance and Full-Scale scores than did children with water As levels < 5.5 mug/L. The association was generally stronger for well-water As than for urinary As.

Authors: Wasserman, Gail A.; Liu, Xinhua; Parvez, Faruque; Ahsan, Habibul; Factor-Litvak, Pam; van Geen, Alexander; Slavkovich, Vesna; Lolocono, Nancy J.; Cheng, Zhongqi; Hussain, Iftikhar; Momotaj, Hassina; Graziano, Joseph H.

Full source: Environmental Health Perspectives 2004, 112(13), 1329-1333 (Eng)

Physico-chemical studies of fluoride in ground water of Patan region (Gujarat)
2005-10-04

A study has been undertaken for the determination of fluoride in drinking water at Patan Taluka and its nearby villages. Fluoride was measured with the help of ion selective electrode method. Most of these villages have more concentration of fluoride than suggested by WHO and ISI. Samples taken from this region have been analyzed and it was found that 75 villages are prone to the excess fluoride concentration in drinking water. The values of fluoride were found to be 0.454 mg/L to 11.4 mg/L.

Authors: Joshi, J. D.; Vora, Jabali; Sharma, Sangita; Patel, Navin; Kothari, Ojas; Salvi, Krutika

Full source: International Journal of Chemical Sciences 2005, 3(1), 129-134 (Eng)