

大闸蟹含二恶英和二恶英样多氯联苯
超出食品安全中心的行动水平
- 常见问题 -

**Hairy crabs with dioxins and dioxin-like polychlorinated biphenyls
exceeding CFS' action levels
- Frequently Asked Questions -**

1	<p>二恶英和二恶英样多氯联苯是什么？</p> <p>What are dioxins and dioxin-like polychlorinated biphenyls (DL-PCBs)?</p>
	<p>二恶英是一组多氯性芳香族化合物，在环境中无处不在，可自然形成（例如火山爆发和森林大火释出），亦是燃烧（例如废物焚化）及各种工业过程（例如制造化学品、以氯漂白纸浆和冶炼金属）产生的副产品。相反，多氯联苯则是人工制造的物质，过往作多种不同工业用途，例如制造电子绝缘体或绝缘液体及专用的液压机液体。</p> <p>Dioxins are a group of polychlorinated aromatic compounds. They are ubiquitous in the environment, occurring naturally (e.g. volcanic eruptions and forest fires), and as by-products of combustion (e.g. waste incineration) and various industrial processes (e.g. production of chemicals, chlorine bleaching of paper pulp and smelting). In contrast, PCBs were manufactured in the past for a variety of industrial uses such as electrical insulators or dielectric fluids and specialised hydraulic fluids.</p>
2	<p>二恶英和二恶英样多氯联苯的主要来源是什么？</p> <p>What are the main sources of dioxins and DL-PCBs?</p>
	<p>二恶英和二恶英样多氯联苯是脂溶性的，不易分解，因此多积聚在脂肪组织，并沿食物链由其他生物到人类逐渐累积。各种二恶英和二恶英样多氯联苯的毒性不一。在所有已鉴别的相关的化合物中，毒性最强的是 2, 3, 7, 8- 四氯二苯并对二恶英 (TCDD)。</p> <p>Dioxins and DL-PCBs are lipophilic and persistent in the environment. Hence, they tend to accumulate in fatty tissues and are passed up the food chain from other living organisms to humans. Different dioxins and DL-PCBs have different degree of toxicity. Of all types of related compounds identified, the most toxic one is 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD).</p>

	<p>自上世纪七十年代开始,大部分国家已禁止生产和使用多氯联苯。不过,以不当的方式焚化废物或不当的方式管理用于处置多氯联苯的废物场地,均会令多氯联苯释放到环境中,污染土壤和水中沉积物,更会沿食物链在生物体内积聚和浓缩。</p> <p>Production and use of PCBs have been banned by most countries since 1970s. However, PCBs can still be released into the environment from improper ways of burning wastes and poorly-maintained waste sites that contain PCBs. Once released into the environment, they contaminate soil and aquatic sediments leading to bioaccumulation and biomagnification of PCBs through food chains.</p> <p>二恶英和二恶英样多氯联苯会在肉类、家禽或海产的脂肪组织积聚,因此动物的寿命较长,脂肪组织积聚的二恶英和二恶英样多氯联苯可能较多。肉类、奶类制品、蛋和鱼等动物源性食物的二恶英和二恶英样多氯联苯含量通常较高。</p> <p>Dioxins and DL-PCBs would concentrate in the fatty tissues of meat, poultry or seafood, and animals with a longer lifespan may have a higher potential accumulation of dioxins and DL-PCBs in their fatty tissues. Foods of animal origin such as meat, dairy products, eggs and fish tend to have higher concentrations of dioxins and DL-PCBs.</p> <p>外国曾发生几次与二恶英有关的食物危机,令公众相当关注。在香港,食物环境卫生署一直密切监察食物含二恶英和二恶英样多氯联苯的情况。</p> <p>Some dioxin-related food crisis occurred in overseas countries have raised considerable public attention and concern. In Hong Kong, the situation of dioxins in foods has been closely monitored by the Food and Environmental Hygiene Department.</p>
3	<p>人类从什么途径摄入二恶英和二恶英样多氯联苯?</p> <p>What are the sources of human exposure to dioxins and DL-PCBs?</p>
	<p>人类会透过食物、食水、空气和皮肤接触等途径摄入二恶英和二恶英样多氯联苯,其中食物是最主要的来源。脂肪含量较高的食物,例如肉类、家禽、海鲜、牛奶、蛋类及其制品,是人类摄入二恶英和二恶英样多氯</p>

	<p>联苯的主要膳食来源。</p> <p>Sources of human exposure to dioxins and DL-PCBs include food intake, drinking water, air inhalation and skin contact. Dietary intake is by far the most important exposure. Fatty foods such as meat, poultry, seafood, milk, egg and their products are the major dietary sources of dioxins and DL-PCBs.</p> <p>至于水生动物，身体一些部位天然含有较高脂肪量的，同时也会含有较多二恶英和二恶英样多氯联苯。例如，鱼肝和螃蟹的棕色肉(包括蟹黄 / 蟹膏及肝胰脏等内脏)含有较多的二恶英和二恶英样多氯联苯。</p> <p>For aquatic animals, body parts which naturally have a higher content of fat may also contain a higher amount of dioxins and DL-PCBs. For example, fish livers and brown meat (includes gonads, livers and digestive glands) of crabs are known to contain higher amount of dioxins and DL-PCBs.</p>
4	<p>二恶英和二恶英样多氯联苯对健康有什么影响？</p> <p>What are the health effects of dioxins and DL-PCBs?</p>
	<p>人类如意外地（例如在职业环境中或工业意外后）摄入大量二恶英和二恶英样多氯联苯，可引致氯痤疮、皮肤出疹及变色等皮肤病和体毛过多。国际癌症研究机构已把二恶英和二恶英样多氯联苯列为人类的致癌物。长期摄入二恶英和二恶英样多氯联苯会牵涉到免疫系统、生殖功能、内分泌系统及发育中神经系统的损害，一些研究亦发现二恶英和二恶英样多氯联苯与人的糖尿病、甲状腺功能异常和心脏病有关。</p> <p>Accidental exposure to large amount of dioxins and DL-PCBs (e.g. in occupational settings or following industrial accidents) could lead to the development of chloracne, skin rashes, skin discolouration and excessive body hair. The International Agency for Research on Cancer (IARC) has classified the dioxins and DL-PCBs as human carcinogens. Long-term exposure to dioxins and DL-PCBs is linked to impairment of the immune system, reproductive function, endocrine system and the developing nervous system. Associations with diabetes, thyroid dysfunction and heart diseases in humans have been reported in some studies.</p>
5	<p>如何量度食物中二恶英和二恶英样多氯联苯的毒性？</p> <p>How to determine the levels of toxicity of dioxins and DL-PCBs in</p>

	<p>food?</p> <p>由于各种二恶英和二恶英样多氯联苯的毒性不一，二恶英和二恶英样多氯联苯的含量是以毒性当量(TEQ)表示。其计算方法是把每种二恶英和二恶英样多氯联苯的含量乘以相关的毒性当量因子，得出该种化学物的毒性当量，然后把各种二恶英和二恶英样多氯联苯的毒性当量加起来，得出其含量。</p> <p>Different dioxins and DL-PCBs exhibit different toxicity levels. The concentration of dioxins and DL-PCBs was expressed as the toxic equivalent (TEQ) and was calculated by summing up the contribution from each chemical. A TEQ was calculated by multiplying the concentration of the chemical with its corresponding toxic equivalency factor.</p>
6	<p>食物安全中心如何评估香港市民摄入二恶英和二恶英样多氯联苯的水平?</p> <p>How does the Center for Food Safety assess the dietary exposure to dioxins and DL-PCBs of the Hong Kong population?</p> <p>食物安全中心在二零一一年十二月公布香港首个总膳食研究的首份报告。该份报告是关于食物中二恶英和二恶英样多氯联苯的研究。研究的结论是摄入量一般的市民每月从膳食摄入二恶英和二恶英样多氯联苯的分量为每公斤体重 21.92 皮克毒性当量，摄入量高的市民则为 59.65 皮克毒性当量，两者的摄入量均低于暂定每月可容忍摄入量（即每公斤体重 70 皮克毒性当量），因此一般市民的健康受到二恶英和二恶英样多氯联苯严重不良影响的机会不大。</p> <p>In December 2011, the Centre for Food Safety released the first report under the First Hong Kong Total Diet Study which studied dioxins and DL-PCBs in food. The report concluded that the dietary exposures to dioxins and DL-PCBs were 21.92 and 59.65 pg TEQ/kg bw/month for average and high consumer of the population, respectively, which were lower than the PTMI (i.e. 70 pg/kg bw/ month). Therefore, the general population was unlikely to experience major undesirable health effects of dioxins and DL-PCBs.</p>
7	<p>既然二恶英和二恶英样多氯联苯广泛存在于环境和食物链之中，什么水平才算是不理想？标准是什么？</p> <p>Since dioxins and DL-PCBs are ubiquitous in the environment and in the food chain, what levels can be regarded as unsatisfactory? What</p>

	<p>are the standards?</p>
	<p>在香港,食物环境卫生署一直密切监察食物含二恶英和二恶英样多氯联苯的情况。食物安全中心在参考国际做法及本地的膳食习惯(即可食部分包括大闸蟹的褐色肉和白肉[#])后,把大闸蟹可食部分中的二恶英含量的行动水平订定为每克食物样本 3.5 皮克毒性当量(湿重计),及二恶英和二恶英样多氯联苯含量总和的行动水平订定为每克食物样本 6.5 皮克毒性当量(湿重计)。</p> <p>[#]褐色肉包括蟹黄/蟹膏(即性腺、消化腺和肝脏等部分),而白肉包括蟹、足和肩膀有肉的部分。</p> <p>In Hong Kong, the situation of dioxins and DL-PCBs in foods has been closely monitored by the Food and Environmental Hygiene Department. After considering international practices and local dietary habits (i.e. edible portions of crabs include brown meat and white meat[*]), the Center for Food Safety established action levels for dioxins as 3.5 pg/g wet weight and sum of dioxins and DL-PCBS as 6.5 pg/g wet weight in edible portions of hairy crabs.</p> <p>[*]brown meat includes gonads, livers and digestive glands and white meat includes muscle meat from appendages of the crabs.</p> <p>要注意的是,个别食物纵使超出二恶英和二恶英样多氯联苯的行动水平,也不表示对健康有即时危害。</p> <p>It should be noted that for individual foods, the exceedance of action levels of dioxins and DL-PCBs does not imply immediate health risks.</p>
8	<p>其他地方在食物中二恶英和二恶英样多氯联苯的标准是什么?</p> <p>What are the standards for dioxins and DL-PCBs in food elsewhere?</p>
	<p>现时,食品法典委员会并未就食物中二恶英和二恶英样多氯联苯含量订定量标准。</p> <p>At present, the Codex Alimentarius Commission (Codex) has not established maximum limits for dioxins and DL-PCBs in foods.</p> <p>中国内地并未就食物中二恶英和二恶英样多氯联苯含量订定量标准。</p> <p>For Mainland China, there is no Guobiao (GB) or action level on dioxins and DL-PCBs.</p> <p>欧洲联盟当局就鱼和鱼类产品及其相关产品(包括螃蟹)的肌肉部分中</p>

	<p>二恶英含量总和制定了每克食物样本 3.5 皮克毒性当量湿重的限量标准, 以及就二恶英及二恶英样多氯联苯化合物含量总和制定了每克食物 6.5 皮克毒性当量湿重的限量标准。就螃蟹来说, 有关限量标准只适用于附属肢的肌肉。</p> <p>The European Commission has established maximum levels for dioxins as 3.5 pg/g wet weight and sum of dioxins and DL-PCBs as 6.5 pg/g wet weight in muscle meat of fish and fishery products (including crabs). In case of crabs, these standards apply to muscle meat from appendages only.</p> <p>台湾当局则就“鱼及其他水产动物之肉及其制品”中二恶英含量总和制定了每克食物 3.5皮克毒性当量湿重的限量标准, 以及就二恶英和二恶英样多氯联苯含量总和制定了每克食物 6.5皮克毒性当量湿重的限量标准。上述限量标准则适用于整个螃蟹的可食用部分(包括蟹膏 / 蟹黄及肝胰脏等内脏)。</p> <p>In Taiwan, maximum levels in fish and other aquatic animals as well as their products for dioxins and sum of dioxins and DL-PCBs are 3.5 pg/g wet weight and 6.5 pg/g wet weight respectively. In case of crabs, the maximum levels apply to the entire edible parts of the animals (including internal organs of crabs such as crab roes and hepatopancreas).</p>
9	<p>为什么以“长期暴露”来评估人体从膳食中摄取二恶英和二恶英样多氯联苯的风险?</p> <p>Why “long-term exposure” is used to assess the health risks associated with the dietary exposure to dioxins and DL-PCBs?</p>
	<p>一般来说, 某些食物或会含有二恶英和二恶英样多氯联苯, 但含量不会引起急性不良影响。二恶英和二恶英样多氯联苯是脂溶性的, 不易分解, 因此多积聚在脂肪组织, 长远有机会对健康构成不良的影响。联合国粮农组织 / 世界卫生组织联合食品添加剂专家委员会在订定有关健康参考值(例如每月可容忍摄入量)时都会参考长期摄入有关污染物的实验数据。</p> <p>In general, some foods may contain dioxins and DL-PCBs; however, the concentrations will not cause acute adverse effects. Nonetheless, dioxins and DL-PCBs are lipophilic and persistent and tend to accumulate in fatty tissues. They may have adverse effects on human health in the long-term. When establishing the health-based guidance value (e.g. Tolerable Monthly</p>

	Intake) for the contaminants, the Joint Food and Agriculture Organization / World Health Organization Expert Committee on Food Additives (JECFA) has taken experimental data on long-term intake of these contaminants into consideration.
10	<p>如果食物中的二恶英和二恶英样多氯联苯水平超出行动水平也不表示对健康有即时危害，那如何界定有关食物的进食风险？</p> <p>If the levels of dioxins and DL-PCBs in food exceed their corresponding action levels do not represent an immediate health hazard, then how could the risks of the concerned foods be assessed?</p>
	<p>慢性毒性方面，联合国粮农组织 / 世界卫生组织联合食品添加剂专家委员会为二恶英和二恶英样多氯联苯订下的暂定每月可容忍摄入量为每月每公斤体重七十皮克毒性当量。暂定每月可容忍摄入量是指个人于一生中，每月可摄取某一种有毒物质而不致对健康构成可见风险的分量(按体重而定)，重点在于考虑到有毒物质可在身体内积聚和人一生的摄入量。只要平均摄入量并非长期超出这一数值，偶然短期摄入高于暂定每月可容忍摄入量的分量也不会影响健康。</p> <p>As regards chronic health effects, the Joint Food and Agriculture Organization / World Health Organization Expert Committee on Food Additives (JECFA) have established a Provisional Tolerable Monthly Intake (PTMI) of 70 pg WHO-TEQ/ kg bw per month for dioxins and DL-PCBs. PTMI is the amount of a toxic substance, expressed on body weight basis, which an individual may ingest monthly over a lifetime without appreciable risk to health. It takes the accumulation of the toxic substance in the body into consideration and stresses on lifetime exposure. Occasional short-term exposure above the PTMI would have no health consequences provided that the average intake over long period is not exceeded.</p> <p>如果从膳食摄入二恶英和二恶英样多氯联苯长期持续高于上述健康参考值，因摄入有关污染物的健康风险便不能排除。</p> <p>However, if the dietary exposure to dioxins and DL-PCBs persistently exceeded the above health-based guidance value for prolonged period, the adverse health risk associated with the pollutant could not be excluded.</p>
11	就今次验出二恶英和二恶英样多氯联苯的大闸蟹样本而言，中心如何评估有关的进食风险？

As regards the detection of dioxins and DL-PCBs in the samples of hairy crabs, how does the Centre for Food Safety assess the risk of eating the concerned hairy crabs?

今次在进口层面抽取的两个大闸蟹样本,被检出二恶英和二恶英样多氯联苯含量为每克食物 11.7 和 40.3 皮克毒性当量。

The two hairy crab samples collected at import level were detected with dioxins and DL-PCBs at levels of 11.7 and 40.3 pg/g TEQ.

以上述二恶英及二恶英样多氯联苯较高含量的样本进行的风险评估显示,一般进食不会对健康构成即时风险或急性中毒。

Risk assessment on the sample with a higher level of dioxins and DL-PCBs indicated that consumers are unlikely to experience immediate adverse health effect or acute toxicosis upon usual consumption.

至于慢性毒性方面,联合国粮农组织 / 世界卫生组织联合食品添加剂专家委员会(专家委员会)为二恶英和二恶英样多氯联苯订下的暂定每月可容忍摄入量为每月每公斤体重七十皮克毒性当量。

Regarding chronic toxicity, the Joint Food and Agriculture Organization / World Health Organization Expert Committee on Food Additives (JECFA) has established a provisional tolerable monthly intake (PTMI) of 70 pg/kg of body weight (bw) / month TEQ.

就每克大闸蟹含四十点三皮克毒性当量的样本而言,风险评估显示在扣除本底暴露值后,一个体重六十公斤的一般人如在该年的大闸蟹季节进食约十四只有关大闸蟹(每只四两重计),便会超出专家委员会所订下的暂定每月可容忍摄入量。至于二恶英和二恶英样多氯联苯暴露量偏高的消费者,如在该年的大闸蟹季节进食约三只有关大闸蟹(每只四两重计),就会超出暂定每月可容忍摄入量。

After taking the background exposure level into account, risk assessment on the sample with dioxins and DL-PCBs at 40.3 pg/g TEQ showed that average consumers of 60 kg body weight can consume 14 hairy crabs (4 taels/pcs) in the hairy crab season in a year without reaching the PTMI. In the case of high consumers, their dietary exposure would exceed the PTMI

	<p>if they consume 3 hairy crabs (4 taels/pcs).</p> <p>要注意的是，只要平均摄入量并非长期超出健康参考值，偶尔短期摄入高于暂定每月可容忍摄入量的分量也不会影响健康。同时，个别食物纵使超出二恶英和二恶英样多氯联苯的行动水平，也不表示对健康有即时危害。</p> <p>It should be highlighted that the transient excursion above the PTMI would have no health consequences provided that the average intake does not continuously exceed the health-based guidance value. Also, mere exceedance of action levels of dioxins and DL-PCBs in a food sample does not necessarily imply acute health risk.</p>
1 2	<p>如何从膳食中减低摄入二恶英和二恶英样多氯联苯的风险？</p> <p>How can the dietary exposure to dioxins and DL-PCBs be reduced?</p>
	<p>防止摄入过量二恶英和二恶英样多氯联苯应从环境控制着手。我们应采取源头控制措施，预防和减少人体的摄入量。国际社会应致力减少二恶英的排放和对食物造成的污染，这一点对减少人体从膳食摄入二恶英和二恶英样多氯联苯十分重要。</p> <p>Prevention and reduction of human exposure should be done through source-directed measures. International efforts in the reduction of dioxins and DL-PCBs emission and their subsequent contaminations of food are essential to reduce the dietary exposure to dioxins and DL-PCBs of the population.</p> <p>市民应去掉肉类的脂肪和食用低脂奶类制品，并应保持均衡及多元化的饮食，包括进食多种蔬果，避免因偏食某几类食物而摄入过量的二恶英和二恶英样多氯联苯。鱼类含有如奥米加-3 脂肪酸、优质蛋白质等多种人体所需的营养素，市民宜适量进食多种鱼类。</p> <p>The public is advised to trim fat from meat and consume low fat dairy products. The public is also advised to have a balanced and varied diet which includes a wide variety of fruit and vegetables so as to avoid excessive exposure to dioxins and DL-PCBs from a small range of food items. As fish contain many essential nutrients, such as omega-3 fatty acids and high quality proteins, moderate consumption of a variety of fish is recommended.</p>

发育中的胎儿对二恶英最为敏感。新生儿的器官系统迅速发育，也可能更易受到一定影响。怀孕和授乳母亲可将污染物传到胎儿和喂哺中的婴儿。根据世界卫生组织，上述减低人体的二恶英及二恶英样多氯联苯含量的长远策略，对女童及年轻女性来说，应是至关重要，可减少日后怀有胎儿和为婴儿喂哺母乳时摄入二恶英及二恶英样多氯联苯的分量。孕妇、授乳母亲和儿童亦应特别注意相关的饮食建议。

The developing fetus is most sensitive to dioxin exposure. Newborn, with rapidly developing organ systems, may also be more vulnerable to certain effects. Pregnant women and lactating mothers can pass the contaminants to their unborn and nursing babies. According to World Health Organization, the above mentioned long-term strategy to reduce body burdens is probably most relevant for girls and young women to reduce exposure of the developing fetus and when breastfeeding infants later on in life. Pregnant women, lactating mothers and children should also pay particular attention to the relevant dietary advice.

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