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食物安全中心

風險評估組

科學主任朱源強先生報告

Reported by Mr. Johnny CHU, Scientific Officer,
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二零一六年九月底，兩個從進口層面抽取的大閘蟹樣本被發現含有二噁英及二噁英樣多氯聯苯，含量超出食物安全中心(中心)所採用的行動水平。為保障市民健康，中心暫停進口及在港出售江蘇省的兩個涉事水產養殖場的大閘蟹。世界其他地方以往亦曾有食物被二噁英及二噁英樣多氯聯苯污染的報告。例如，二零零八年，愛爾蘭豬肉被發現二噁英及二噁英樣多氯聯苯超標；一九九九年，比利時的豬肉、家禽及蛋被發現二噁英含量甚高。經追查發現，引致這兩次事故的原因是動物飼料被二噁英及二噁英樣多氯聯苯污染。

什麼是二噁英及二噁英樣多氯聯苯？

二噁英及二噁英樣多氯聯苯是毒性作用相似的環境污染物，其性質、來源及安全問題已在上期討論。簡言之，二噁英及二噁英樣多氯聯苯會對人類健康造成長遠的累積風險，包括導致兒童及成人分別出現發育及生育問題，還可令人致癌。

二噁英及二噁英樣多氯聯苯怎樣污染大閘蟹？

大閘蟹在溪澗、河流及湖出沒。大閘蟹在棲息地的水底覓食，並幾乎吃掉覓得的所有東西。二噁英及二噁英樣多氯聯苯一旦釋出，會污染土壤表面及水中沉積物，並沿食物鏈在生物體內積聚和濃縮(即濃度增加)(見圖)。

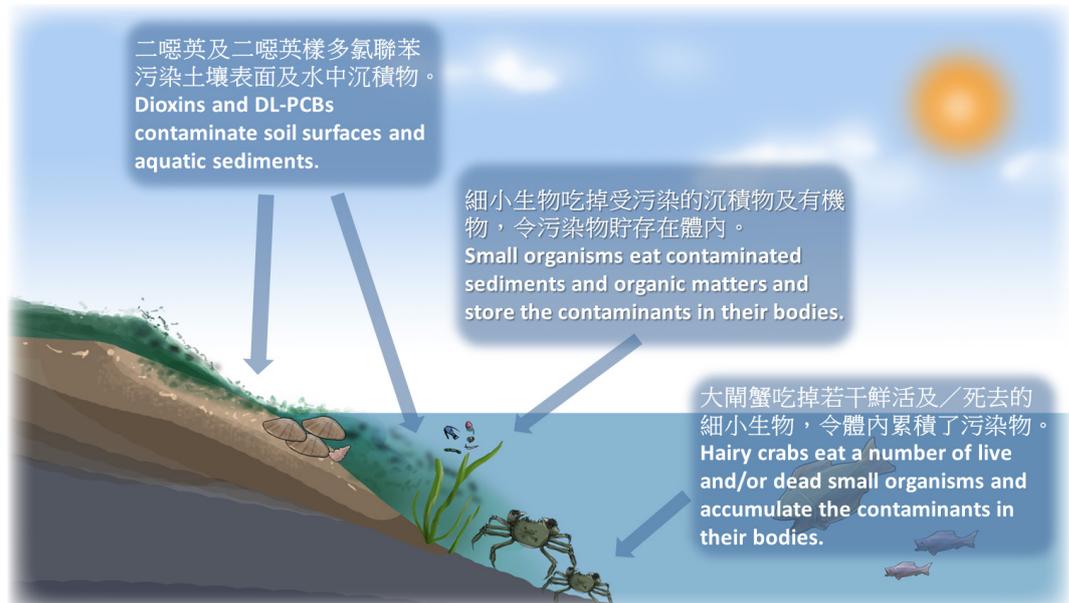
In late September 2016, two hairy crab samples collected at import level were found to contain dioxins and dioxin-like polychlorinated biphenyls (DL-PCBs) at a level exceeding the action level adopted by the Centre for Food Safety (CFS). To safeguard public health, the CFS suspended the import and sale within Hong Kong of the hairy crabs from the two concerned aquaculture farms in Jiangsu Province. In previous years, there were also reports of contamination of food with dioxins and DL-PCBs in other parts of the world. For example, in 2008, elevated levels of dioxins and DL-PCBs were found in Irish pork and in 1999, high levels of dioxins were found in pork, poultry and eggs from Belgium; the causes of these two incidents were traced to animal feed contaminated with dioxins and DL-PCBs.

What are Dioxins and DL-PCBs?

Dioxins and DL-PCBs are environmental pollutants with similar toxic effects. Their nature, sources and safety concerns have been discussed in the last issue. In brief, their long-term cumulative risk to health includes developmental problems in children and reproductive problems in adults as well as cancer-causing in humans.

How do Dioxins and DL-PCBs Contaminate Hairy Crabs?

Hairy crabs occur in streams, rivers and lakes. They scavenge for food at the bottom of habitats and eat almost everything they can find. Dioxins and DL-PCBs, once released, contaminate soil surfaces and aquatic sediments leading to bioaccumulation and biomagnification (i.e. increasing concentration) of the contaminants through the food chain (see Fig).



二噁英及二噁英樣多氯聯苯在大閘蟹體內積聚和濃縮
Bioaccumulation and Biomagnification of Dioxins and Polychlorinated Biphenyls in Hairy Crabs

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焦點個案
Incident in Focus

大閘蟹的哪些部位含有較多二噁英及二噁英樣多氯聯苯？

大閘蟹的可食用部分大致可分為白肉及褐色肉。白肉呈白色，生長在蟹螯、蟹足及蟹身。褐色肉呈褐綠色，生長在蟹身主體部分，主要是蟹的消化器官(肝胰臟)及生殖器官。

褐色肉(即消化及生殖器官)的脂肪量遠高於白肉。由於二噁英及二噁英樣多氯聯苯屬脂溶性，故往往在褐色肉積聚。荷蘭食品及消費產品安全局(Dutch Food and Consumer Product Safety Authority)在二零一二年委託進行的一項研究顯示，從某些受污染河流抽取的大閘蟹樣本，褐色肉的二噁英及二噁英樣多氯聯苯含量較白肉高15至115倍。該研究根據在荷蘭九個地點的大閘蟹的二噁英及二噁英樣多氯聯苯的平均含量(每克29.1皮克毒性當量)估計，本底暴露值較高的消費者若每月進食大閘蟹(約3兩重的蟹)的50克肉(即約1.3兩)，便會超出二噁英及二噁英樣多氯聯苯的**暫定每月可容忍攝入量**(健康參考值)。

規管情況

現時，食品法典委員會未就食物中二噁英及二噁英樣多氯聯苯含量訂定限量標準。自一九九九年，香港在食物監察計劃中就所有食物(包括大閘蟹)所採用的二噁英含量行動水平為每克1皮克。中心採納的大閘蟹二噁英及二噁英樣多氯聯苯含量總和的行動水平為每克6.5皮克。

注意要點：

1. 二噁英及二噁英樣多氯聯苯是一組持久性環境污染物。
2. 因長期攝入對健康造成的不良影響，包括兒童的發育問題、成人的生育問題，以及令人致癌。
3. 蟹的褐色肉因脂肪含量較高，故含有較多污染物，例如二噁英及二噁英樣多氯聯苯。

給市民的建議

由於二噁英及二噁英樣多氯聯苯在全球環境中無處不在，所有人均會受到本底暴露，但預計不影響人體健康。儘管如此，世界衛生組織認為減低人體的二噁英及二噁英樣多氯聯苯含量(體內水平)屬長期策略，尤其對女童及年輕女性來說，可能更為適切，因為可令發育中的胎兒，以及日後以母乳餵哺的嬰兒減少攝入二噁英及二噁英樣多氯聯苯。

- 由於二噁英及二噁英樣多氯聯苯積聚在動物脂肪，故去掉肉類的脂肪和食用低脂奶類製品或可減少攝入二噁英及二噁英樣多氯聯苯。
- 保持均衡飲食(包括進食充足水果、蔬菜及穀類食品)有助避免從單一食物來源攝入過量二噁英及二噁英樣多氯聯苯。
- 適量食用大閘蟹。

給業界的建議

- 從受有關當局規管的水產養殖場及商譽良好的出口商購買鮮活大閘蟹。
- 在香港，所有在市面出售的食物必須適合供人食用。業界應確保出售或進口的食物均適合供人食用，並符合法律要求。

Which Parts of Hairy Crabs Contain More Dioxins and DL-PCBs?

The edible portion of hairy crabs can broadly be divided into white meat and brown meat. White meat is white in colour and is present in the claws, legs and also in the body. Brown meat is brownish-green and is obtained from the main body of the crab. It consists mainly of the crab's digestive organ (hepatopancreas) and reproductive organs.

The amount of fat in brown meat (i.e. digestive and reproductive organs) is much higher than that in white meat. Since dioxins and DL-PCBs are fat-soluble, they tend to accumulate in the brown meat. A study commissioned by the Dutch Food and Consumer Product Safety Authority in 2012 showed that brown meat of hairy crabs sampled from some polluted rivers may contain dioxins and DL-PCBs at levels 15 to 115 times higher than that in white meat. Based on the average levels of dioxins and DL-PCBs (29.1 pg TEQ/g) in 9 locations in the Netherlands, the study estimated that the **PTMI** (a health-based guidance value) for dioxins and DL-PCBs would be exceeded by consumers with a high background exposure when a portion of 50 g meat (i.e. about 1.3 tael) of hairy crab (about a 3-tael crab) is consumed once a month.

Regulatory Control

At present, the Codex Alimentarius Commission has not established maximum limits for dioxins and DL-PCBs in foods. In Hong Kong, an action level of 1 pg/g for dioxins for all food commodities (including hairy crabs) has been adopted in the food surveillance programme since 1999. An action level of 6.5 pg/g for the sum of dioxins and DL-PCBs in hairy crabs have been adopted by CFS.

Key Points to Note:

1. Dioxins and DL-PCBs are a group of persistent environmental pollutants.
2. Adverse health effects arising from long-term exposure include developmental problems in children and reproductive problems in adults as well as carcinogenic to humans.
3. Because of a higher content of fat, brown meat of crabs is known to contain higher amount of contaminants such as dioxins and DL-PCBs.

Advice to Public

Dioxins and DL-PCBs are found throughout the world in the environment and all people have background exposure which is not expected to affect human health. Nonetheless, the World Health Organization opines that the reduction of body burdens (level in the body) is a long-term strategy and is probably most relevant for girls and young women to reduce exposure of the developing fetus and when breastfeeding infants later on in life.

- As dioxins and DL-PCBs accumulate in fats of animals, trimming fat from meat and consuming low fat dairy products may decrease the exposure.
- A balanced diet (including adequate amounts of fruits, vegetables and cereals) will help to avoid excessive exposure from a single source.
- Consume hairy crabs in moderation.

Advice to Trade

- Purchase live hairy crabs from aquaculture farms that are regulated by the relevant authorities and from reputable exporters.
- In Hong Kong, all food available for sale in the market must be fit for human consumption. The trade should ensure that the food they sell or import is fit for human consumption and comply with legal standards.



什麼是“健康一體”？ What is One Health?

食物安全中心
風險評估組
吳雪兒獸醫報告

Reported by Dr. Cherrie NG, Veterinary Officer,
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“健康一體”的概念是在二零零零年代初提出。世界動物衛生組織(動物衛生組織)概述這個理念是指人類與動物的健康彼此依存，並與所生存的生態系統的健康息息相關。聯合國糧食及農業組織(糧農組織)、動物衛生組織及世界衛生組織(世衛)認為，應對人類-動物-生態系統界面的健康風險，有賴在多個問題上持不同觀點及持有不同資源的各界人士攜手合作。這是在社會、國家以至全球層面上從事不同專業的人士同心協力，旨在令人類、動物及生態體系達致最理想的健康狀況。糧農組織、動物衛生組織及世衛三方機構已正式支持“健康一體”的概念，並於二零一零年四月的《三方概念文件》(Tripartite Concept Note)提出。

人類、動物與生態系統的互連關係

由於人口持續增長，人類跨境活動日益頻繁，人類、動物與生態系統之間的互連關係更顯重要。由於食物需求上升，畜牧業亦隨之增長以提供食物。除了食用動物外，人類與動物的緊密關係(即人畜之間能影響彼此的心理及生理狀況的互動關係)亦日趨密切。上述種種情況可能會令人類與野生動物及其棲息地增加接觸，導致接觸新的病毒、細菌及其他致病的病原體的機會增加。

生態系統的健康包括海陸世界的活生及非活生成分的健康。隨着人口及畜牧養殖量的增長，地球的氣候及土地用途(包括林木砍伐及集約化農業)有所轉變。此外，生態系統亦被個人護理產品及藥品玷污。有關轉變及玷污可能造成環境惡化、污染及生態壓力，對人畜健康造成潛在不良影響。

與“健康一體”有關的主要問題

採用“健康一體”方式可加強人類、動物與生態系統的衛生界別之間的協作，以應付相關問題，包括但不限於疾病的診斷、監察及控制、抵抗現有及新出現的疾病及人畜共患病、抗微生物藥物耐藥性、食物安全及糧食安全和環境衛生及保護。以下為一些與食物安全有關的主要問題(見圖)：

人畜共患病

人畜共患病是指脊椎動物與人類之間自然傳播的疾病及感染，例如狂犬病、H5N1禽流感及嚴重急性呼吸系統綜合症。根據世衛表示，過去十年，在所有人類病原體中，最少61%屬人畜共患，佔所有新出現的疾病病原體的75%。

抗微生物藥物耐藥性

抗微生物藥物耐藥性問題對公共衛生的威脅愈來愈大，備受各國及多個界別的廣泛關注。抗微生物藥物耐藥性涉及不同

The One Health concept was introduced at the beginning of the 2000s. The World Organisation for Animal Health (OIE) has summarised it as an idea that human health and animal health are interdependent and bound to the health of the ecosystem in which they exist. The Food and Agriculture Organization (FAO) of the United Nations, the OIE and the World Health Organization (WHO) recognise that addressing health risks at the human-animal-ecosystems interfaces requires partnerships among players with different perspectives on some issues and different levels of resources. It is the integrative effort of different disciplines working in the community, as a nation and globally to aim for optimal health for humans, animals and the ecosystem. The concept of One Health has been formally endorsed by the FAO-OIE-WHO Tripartite and was presented in the Tripartite Concept Note in April, 2010.

The Interconnection of Human, Animals and Ecosystem

As the human population and their movement across countries continue to increase, the interconnection of human, animals and the ecosystem becomes more significant. The demand for food rises resulting in increase in animal production to provide food. Apart from animals providing food, the human-animal bond, the dynamic relationship between people and animals in that each influences the psychological and physiological state of the other, has also continued to grow. All of the above may contribute to increase in the contact between human and wild animals and their habitat leading to more chances of exposure to new viruses, bacteria and other disease-causing pathogens.

Ecosystem health involves the health of the living and non-living components of the land and marine world. With the increase in human population and animal production, the Earth has experienced changes in climate and land use including deforestation and intensive farming practices. Contamination of the ecosystem by personal care products and pharmaceuticals has also been detected. Such changes and contamination may cause environmental degradation, pollution and ecological stress leading to potential negative impact on both human and animal health.

Key Issues Related to One Health

The One Health approach can enhance the collaboration between human, animal and ecosystem health sectors in order to address related issues, including but not limited to disease diagnosis, surveillance and control, combating existing and emerging diseases and zoonoses, antimicrobial resistance, food safety and food security and environmental health and environmental preservation. Some key issues related to food safety (see Fig) are highlighted below:

Zoonoses

Zoonoses are diseases and infections that are naturally transmitted between vertebrate animals and humans, examples are rabies, avian influenza H5N1 and SARS. According to the WHO, at least 61% of all human pathogens are zoonotic and have represented 75% of all emerging pathogens during the past decade.

Antimicrobial Resistance

Antimicrobial resistance (AMR) is a growing public health threat of broad concern to countries and multiple sectors. It involves various resistance mechanisms affecting a wide range of bacteria, most of which are capable of causing diseases in humans and animals. AMR,



“健康一體”：人類-動物-生態系統的互連關係及與食物安全有關的主要問題
One Health: Human-Animal-Ecosystem Interconnection and Key Issues Related to Food Safety

的耐藥機制，影響多種細菌，當中大部分可令人畜致病。抗微生物藥物耐藥性(特別是多重耐藥性)問題可導致醫護成本上升、治療失效，甚至死亡。

食物安全

如上文所述，食物需求上升令活生牲畜量增加，全球需運輸數以百萬噸計的牲畜及農產品。一些食源性疾病屬人畜共患性質，因食用受病原微生物污染的食物所引致。常見的食源性人畜共患病有沙門氏菌、彎曲菌及大腸桿菌感染，如同時出現抗微生物藥物耐藥性，均可成為嚴重的食源性感染。

我們將會在下期進一步說明“健康一體”，並集中探討這個概念與食物安全有關的問題。

especially multidrug resistance, has resulted in higher costs in health care, failure of treatments and deaths.

Food Safety

As mentioned above, the increase in food demand results in expansion of livestock population and worldwide transport of millions of tonnes of animal and agricultural products. Some food-borne diseases can also be of zoonotic in nature, which are caused by consumption of food contaminated by pathogenic microorganisms. Common food-borne zoonoses are Salmonellosis, Campylobacteriosis and infection by *E. coli* where if AMR presents, can become severe food-borne infections.

In the next issue, we will further illustrate One Health with more focus on food safety.



軟雪糕與食物安全

食物安全中心在上月發現從一個零售點抽取的若干軟雪糕樣本的總含菌量及大腸菌群含量超出法例上限。軟雪糕若不符合這個含細菌標準，顯示軟雪糕的製造過程的衛生狀況未如理想，但不一定表示食用會導致食物中毒。

軟雪糕通常貯存在雪櫃溫度。軟雪糕售賣機的衛生及清潔情況可導致機器受李斯特菌污染。孕婦應考慮不再食用軟雪糕，以免染上李斯特菌病。提供軟雪糕的食肆應遵守製造及售賣冰凍甜點的食物安全建議，包括：1)定期檢查軟雪糕售賣機的溫度；2)安排定期檢查、保養和維修軟雪糕售賣機；以及3)定期向食物從業員提供有關設備操作(包括如何清潔軟雪糕售賣機)及食物衛生的培訓。

Soft Ice-cream and Food Safety

Last month, the Centre for Food Safety found some soft ice-cream samples in a retail outlet containing total bacterial counts and coliform counts exceeding the legal limits. Soft ice-cream failing this bacteriological standard suggests suboptimal hygienic conditions of its processing, but does not necessarily mean that consumption would lead to food poisoning.

Soft ice-cream is typically kept at refrigeration temperature. Poor hygiene and cleaning of the soft ice-cream dispensing machines can lead to *Listeria* contaminating the machine. Pregnant women should consider avoiding soft ice-cream to prevent listeriosis. Food premises providing soft ice-cream are advised to observe the Food Safety Advice for Manufacture and Sale of Frozen Confections. This includes: 1) checking the temperature of soft ice-cream dispensing machines regularly; 2) arranging regular inspection, maintenance and repair of soft ice-cream dispensing machine; and 3) providing regular training to food handlers on the operation of equipment (include cleaning of soft ice-cream dispensing machine) and hygienic practices.

可減少使用或取代含鋁食物添加劑

食物安全中心(中心)在上月發表有關食物中鋁含量的跟進研究。若干動物研究顯示，鋁化合物可能影響生育及發育。食物是攝入鋁的主要來源。中心的研究發現，含鋁食物添加劑含量偏高的食物包括海蜆、蒸包或蒸糕及一些烘焙食品(例如雞蛋仔)。根據風險評估顯示，一般市民的健康受鋁嚴重影響的機會不大。不過，消費者經常食用同一牌子鋁含量高的食品，則不能排除健康會受鋁影響的可能性。

業界應降低含鋁食物添加劑在食物中的含量，或以其他替代品取代(例如以正磷酸鈣取代磷酸鋁鈉作為膨脹劑；以硅酸鈣取代硅酸鋁作為抗結劑)。市民應保持均衡飲食，以免因偏食某幾類食物而攝入過量的鋁。消費者在購買預先包裝食品時，可參考食物標籤，查看食品有否加入含鋁食物添加劑。

Aluminium-containing Additives in Foods Can be Reduced/Replaced

Last month, the Centre for Food Safety released its follow-up study on aluminium in food. Animal studies showed aluminium compounds may affect reproduction and development. Food is the major source of aluminium intake. The study revealed that foods high in aluminium-containing additives include jelly fish, steamed bun/cake and some bakery products such as egg waffles. Risk assessment showed that the general public are unlikely to experience undesirable health effects of aluminium. However, for consumers with brand loyalty to products with high aluminium levels, adverse health effects cannot be ruled out.

The trade should reduce the levels of aluminium-containing additives in food or replacing them by other alternatives (e.g. monocalcium phosphates for sodium aluminium phosphates as a leavening agent and calcium silicate for aluminium silicate as an anticaking agent). The public is advised to maintain a balanced diet so as to avoid excessive exposure of aluminium from a small range of foods. When purchasing prepackaged foods, consumers can refer to the [food labels](#) on whether aluminium-containing additives have been used.

風險傳達 工作一覽 Summary of Risk Communication Work

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