

## 本期內容 IN THIS ISSUE

### 焦點個案

在內地輸往日本的鰻魚中驗出硫丹

### 食物安全平台

食物安全中的危害與風險(下篇)

### 食物事故點滴

進食生或未經徹底煮熟的淡水水產的風險

何謂事故/食物安全個案?

### 風險傳達工作一覽

### Incident in Focus

Endosulfan Detected in Eels Exported to Japan from Mainland China

### Food Safety Platform

Hazard and Risk in Food Safety (Part II)

### Food Incident Highlight

Danger of Eating Raw or Undercooked Freshwater Animals

What Constitutes an Incident/Food Safety Case?

### Summary of Risk

### Communication Work

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## 焦點個案 Incident in Focus



食物安全中心風險傳達組  
科學主任游天頌先生報告

## 在內地輸往日本的鰻魚中驗出硫丹 Endosulfan Detected in Eels Exported to Japan from Mainland China

Reported by Mr. Arthur YAU, Scientific Officer,  
Risk Communication Section, Centre for Food Safety

### 事件摘要

二零零六年八月二十三日,傳媒報道日本厚生勞動省發現產自中國廣東省和上海的活鰻所含的除害劑硫丹超出該國的規定。食物安全中心(中心)遂向廣東出入境檢驗檢疫局查詢。該局證實有關魚場並無向本港出口鰻魚。本中心在得悉報道後抽取了活鰻和鰻魚製品樣本作硫丹測試,結果全部令人滿意,市民無須擔心。

### 什麼是硫丹?

硫丹是一種除害劑,不少國家均有使用,屬於獲准在本港使用的註冊除害劑,主要用作控制蔬果中的害蟲。食品法典委員會<sup>1</sup>就硫丹在若干食品的使用上訂定規管標準,即最高殘餘限量(表一)。由於部分魚類對其藥性甚為敏感,硫丹一般不用於魚類養殖。現時並無有關魚類中殘餘硫丹的國際標準。

表一:食品法典委員會就下列選取食品訂定的硫丹最高殘餘限量

食品	最高殘餘限量 (百萬分之)
紅蘿蔔	0.2
青瓜	0.5
生菜	1
菠菜	2
肉類(取自並非在水中生活的哺乳類動物)	0.1 (以脂肪中計)
甜橙和酸橙	0.5
提子	1
菠蘿	2

資料來源:食品法典委員會

### 什麼是有機氯除害劑?

硫丹是一種有機氯除害劑。有機氯除害劑的化學結構包含氯,會長時間存留在環境。基於這種特質,食物可能會因為受環境污染而含有少量這些化學物。部分有機氯除

### Summary of Incident

On 23 August 2006, the media reported that the Ministry of Health, Labour and Welfare of Japan had found that live eels imported from Guangdong Province and Shanghai, China contained the pesticide endosulfan at levels exceeding their requirement. In response to the Centre for Food Safety's (CFS) enquiry, the Guangdong Inspection and Quarantine Bureau (GDCIQ) confirmed that the concerned farms did not export eels to Hong Kong. Following the report, samples of live eels and eel products were collected by the CFS. They showed satisfactory results of endosulfan. There was no cause for alarm.

### What is Endosulfan?

Endosulfan is a pesticide used in many countries worldwide. The pesticide is registered and permitted to be used in Hong Kong. It is mainly used to control insects in fruits and vegetables and the regulatory standards in the form of maximum residue limits are set for its use in certain food commodities by the Codex Alimentarius Commission (Codex)<sup>1</sup> (Table 1). Endosulfan is normally not used in fish farming as some fish species are very sensitive to the effect of endosulfan and no international standard has been set for endosulfan residue in fish.

Table 1: Codex maximum residue limits for endosulfan in selected food commodities

Commodity	Maximum Residue Limits (ppm)
Carrot	0.2
Cucumber	0.5
Lettuce,	1
Spinach	2
Meat (from mammals other than marine mammals)	0.1 (applies to fat)
Oranges, Sweet, Sour	0.5
Grapes	1
Pineapple	2

Source: Codex

### What about Organochlorine (OC) Pesticides?

Endosulfan is a type of organochlorine pesticide. OC pesticides contain chlorine in

<sup>1</sup>食品法典委員會是世界衛生組織和聯合國糧食及農業組織轄下的國際組織,專責訂定食物安全標準。以下網頁內的文件詳細介紹其組織。

<sup>2</sup>Codex is an international body under the World Health Organization (WHO) and Food and Agriculture Organization (FAO) of the United Nations for setting food safety standards. The website contains documents with detailed description of what Codex is.

焦點個案  
Incident in Focus

害劑，例如滴滴涕、氯丹和六氯(代)苯，由於會長時間存留在環境，無處不在，加上會在生物體內積累，故特別受關注，列為持久性有機污染物。

對健康的影響

**急性硫丹中毒**的症狀包括過度活躍和肌肉抽搐，而**慢性中毒**則可能會對腎臟造成損害。不過，硫丹並不會致癌。

中心採用國際認可的方法，根據日本在鰻魚中驗出的最高硫丹含量和本港中學生的食用模式(本中心現正蒐集成人食用量數據)進行風險評估。結果顯示，進食有關鰻魚導致額外攝入少於1%國際機關訂定的硫丹安全參考值(慢性中毒會以“每日可攝入量”<sup>2</sup>表示)(“食物安全平台”一欄會談及更多有關食物安全的危害與風險)。至於急性中毒方面，亦會導致百分比相若的額外攝入急性參考劑量<sup>3</sup>。

表二：估計從日本驗出鰻魚硫丹含量額外攝入的硫丹每日可攝入量和硫丹急性參考劑量百分比

急性中毒 (%急性參考劑量)	
每日食用70克燒鰻魚	0.6%
慢性中毒 (%每日可攝入量)	
中學生	
平均食用量	0.1%
食用量偏高	0.5%

跟進工作

在事件發生後，中心即時與內地廣東出入境檢驗檢疫局聯絡。內地當局證實有關魚場並無供應活鰻給本港。為進一步評估有關情況，中心抽取了鰻魚和鰻魚製品樣本作硫丹測試。在測試的六個鰻魚樣本中，有四個並無驗出硫丹，其餘則只發現少量硫丹(約為百萬分之零點零二)。市民無須擔心。

表三：本港在二零零五年曾作有機氯除害劑測試的肉類和蔬菜數目

除害劑	肉類樣本數目	蔬菜樣本數目	不滿意的結果數目
有機氯除害劑 (包括硫丹)	30	47	0

給市民的意見

從內地進口活鰻的進口商應只向註冊供港魚場採購，而每批活鰻須附有衛生證明書。零售商和消費者應向可靠及信譽良好的供應商購買水產。此外，消費者亦應保持均衡飲食，以免因偏食而攝入過量化學物。

更多資料

讀者如有興趣更深入了解此事，請登入下列相關網頁：

- 有關“食物中殘餘除害劑”的風險簡訊；以及
- 有關“食物中殘餘除害劑”的常見問題。

<sup>2</sup> 化學物的每日可攝入量，是根據進行評估時所有已知資料，按人體的體重計算，估計人於一生中每天從食物或食水攝取該化學物而不致對健康帶來風險的分量。

<sup>3</sup> 化學物的急性參考劑量，是根據進行評估時所有已知資料，按人體的體重計算，估計人於二十四小時或更短時間內從食物及/或食水攝取該化學物而不致對健康帶來風險的分量。

<sup>2</sup> The ADI of a chemical is the estimate of the amount of a substance in food or drinking-water, expressed on a body-weight basis, that can be ingested daily over a lifetime without appreciable health risk to the consumer on the basis of all the known facts at the time of the evaluation.

<sup>3</sup> The ARfD of a chemical is an estimate of the amount of a substance in food and/or drinking water, normally expressed on a body weight basis, that can be ingested in a period of 24 hours or less without appreciable health risk to the consumer on the basis of all known facts at the time of the evaluation

their chemical structure and tend to be persistent in the environment. Because of this property, low levels of some of these chemicals in foods might be present as a result of environmental contamination. Some, but not all, OC pesticides, such as DDT, chlordane and hexachlorobenzene, are of particular concern due to their persistence and ubiquitous nature in the environment and their tendency to bioaccumulate in animals. They are classified as persistent organic pollutants (POPs).

Health Effect

Symptoms of **acute poisoning** caused by endosulfan include hyperactivity and muscle spasm, while **chronic toxicity** may cause kidney damage. However, endosulfan is not known to be carcinogenic.

Risk assessment using internationally accepted methodology, the highest level of endosulfan detected in eels in Japan and the consumption pattern of local secondary school students (as collection of adult consumption data is underway) showed that consumption of the eel concerned would contribute less than 1% of the safety reference value (in terms of acceptable daily intake<sup>2</sup> (ADI) for chronic toxicity) set for endosulfan by international authority. (You may read more about hazard and risk in food safety in the “Food Safety Platform” column.) The percent contribution to acute reference dose<sup>3</sup> (ARfD) is similar when acute toxic effects are concerned.

Table 2: Estimation of percentage contribution of endosulfan to ADI and ARfD from eels at the level detected in Japan

Acute Toxicity (% ARfD)	
Consumption of 70g of grilled eel a day	0.6%
Chronic Toxicity (% ADI)	
Secondary school students	
Average consumption level	0.1%
High consumption level	0.5%

Follow-up Actions

As a result of the incident, the CFS immediately contacted the GDCIQ in Mainland China. The Mainland authority confirmed that the concerned fish farms were not supplying live eels to Hong Kong. To further assess the situation, the CFS collected samples of eels and eel products for examination of endosulfan. Among the six eel samples tested, no endosulfan was detected in four of them and only small amounts (about 0.02 ppm) of endosulfan were detected in the remainder. There is no cause for alarm.

Table 3: Number of meat and vegetable samples analyzed for OC pesticides in Hong Kong, 2005.

Pesticides	Number of Meat Samples	Number of Vegetable Samples	Number of Unsatisfactory Results
OC pesticides, including endosulfan	30	47	0

Advice to the Public

Importers of live eels from Mainland China should only source eels from farms registered for export to Hong Kong and each consignment should be accompanied with a health certificate. Retailers and consumers are advised to purchase aquatic products from reliable and reputable suppliers. Consumers are advised to maintain a balanced diet in order to avoid excessive intake of chemicals from a small range of food items.

Further Information

For readers who are interested to understand more about the incident, please visit the following related web pages for further information:

- Risk in Brief on “Pesticide Residues in Food”; and
- FAQ for pesticide residues in food.

# 食物安全中的危害與風險(下篇)

## Hazard and Risk in Food Safety (Part II)

食物安全中心風險評估組  
研究主任鄧紹平博士報告

Reported by Dr. Anna TANG, Research Officer,  
Risk Assessment Section, Centre for Food Safety

### 引言

正如上篇所說，危害和風險是我們日常生活的一部分。在食物方面，我們經常會攝入各類可能對健康有害的天然或人造物質。這些物質或因污染而意外存在於食物中，或為改善食物質感或味道等而刻意添加。現代科技日新月異，我們能夠驗出這些物質在食物中愈來愈微小的分量。要禁絕所有食物危害是不切實際的，我們攝入這些危害的分量決定它們會否對我們健康構成風險。

### 劑量因素

攝入太多有益的東西可能會有害；攝入一丁點有害的東西卻未必如我們想像中那麼壞。“劑量”指我們攝入某物質的分量和攝入時間的長短，可決定該物質是否屬於毒物。以氧氣為例，我們每個人都需要它才能生存，所以氧氣是有益的東西。然而，濃度超過60%的氧氣卻可能引致肺部不適，影響呼吸。長時間攝入高濃度氧氣會導致氧氣中毒、抽筋和神智不清。同樣，維他命是我們生命中十分重要的物質，但攝入過量則屬於毒物，可能對身體有害。

### 安全參考值

在食物安全監管的範疇中，安全參考值是就安全攝入量而制定的指引，表示人在一段時間內攝入某物質而不致對健康帶來可見風險的分量。當談及急性或即時反應時，“急性參考劑量”會用作在一段短時間(例如一日)內安全攝入某物質的參考值。當談及慢性或長期影響時，通常會以一生為基礎的“每日可攝入量”(適用於食物添加劑)和“每天/每周/每月可容許攝入量”(適用於食物污染物)等作為參考值。由於這些慢性參考值是以一生攝入量而訂定，只要攝入量並非高至足以引致即時反應和長期超出水平，偶爾攝入高於這些參考值的分量不會影響健康。

常用的安全參考值包括聯合國糧食及農業組織/世界衛生組織聯合食物添加劑專家委員會(專家委員會)和聯合國糧食及農業組織/世界衛生組織農藥殘留聯合會議所訂定的各項參考值。兩個組織參考了動物研究結果和人類研究數據作出安全評估，並根據評估就食物添加劑和污染物訂定安全參考值。為保障公眾健康，這些參考值有很大的容差。兩個組織會對經其評估的物質作定期檢討，以確保有最新的科學數據時可加以考慮。

### 以水銀為例

水銀是一種可能會影響健康的重金屬，對正在發育的胎兒和兒童的神經系統及常人的腎臟影響尤為嚴重。日常飲食是攝入水銀的主要途徑。

現將本港中學生的水銀攝入量與相關的安全參考值(專家委員會所訂定的暫定每周可容許攝入量)會用於這一例子作一比較(圖一)，以估計這類人士從食物中攝入水銀的

### Introduction

As mentioned in Part I, hazards and risks are part of everyday life. For food, we are constantly exposed to various materials, natural or synthetic, that are potentially hazardous to us which may be present unintentionally due to contamination or added intentionally for reasons like improving texture and taste. With advances in modern technology, we are able to detect these materials at a lower and lower level. While achieving zero tolerance for all food hazards is not realistic, our exposure to these hazards will determine if our health is at risk.

### The Effect of Dose

Too much of a good thing may be bad. A little of a bad thing may not be as bad as we may think. Dose, i.e. amount of substance we are exposed to and the duration of exposure determines whether something is a poison. Taking oxygen as an example, it is a good thing because we all need it for survival. However, oxygen concentration above 60 % may cause irritation to lungs and affect respiration. High oxygen concentration over a prolonged period can lead to oxygen poisoning, causing convulsions and unconsciousness. Similarly, vitamins, which are essential to our life, can be considered as poisons when they are taken in excess because harmful effects to our bodies may occur.

### Safety Reference Values

In food safety control, safety reference values are established as guidelines for a safe level of intake. They represent the amounts of a substance that can be ingested by a person over a period of time without appreciable health risk. When considering acute or immediate effects, an “acute reference dose” is used as a reference for the safe ingestion of a substance over a short period of time (e.g. 1 day). When considering chronic or long term effects, values such as “acceptable daily intake” (ADI) for food additives and “tolerable daily/weekly/monthly intake” for food contaminants over a lifetime period are usually taken as reference. Since these chronic reference values are determined based on lifetime intake, an occasional exposure above these values would not cause harm to health provided that the level is not high enough to cause immediate effects and its intake is not over in the long term.

Safety reference values generally used are those established by the Joint FAO/WHO Expert Committee on Food Additives (JECFA) and the Joint FAO/WHO Meeting on Pesticide Residues (JMPR). These organizations establish safety reference values for food additives and contaminants following safety assessments that take into account results of animal studies and human data. An ample margin of safety is given to protect public health. Substances evaluated by the JECFA and the JMPR undergo a periodic review procedure to ensure that new scientific data are considered whenever available.

### Mercury as an Example

Mercury is a heavy metal that may cause adverse health effects particularly to the nervous system of developing fetuses and children and the kidney. Dietary food items are the major source of mercury.

The risk associated with ingestion of mercury in food by Hong Kong secondary school students can be

圖一 食物中水銀對健康的影響的評估  
Figure 1. Assessment on the Health Effects of Mercury in Food



食物安全平台

Food Safety Platform

風險。一般而言，從食物中攝入某物質的分量如低於安全參考值，因攝入該物質而影響健康的風險則屬於可以接受。

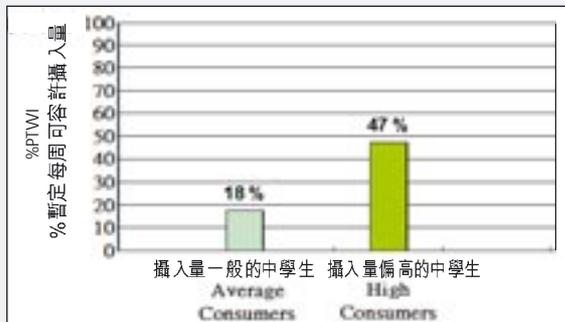
根據本港中學生的食用模式和化驗分析釐定的食物中水銀分量，攝入量一般和偏高的中學生的估計攝入量均低於暫定每周可容許攝入量(圖二)，故此這類人士從食物中攝入水銀以致影響健康的風險並不高。

estimated by comparing the **intake** of mercury (i.e. the exposure) in this group of population with the appropriate **safety reference value** (in this case provisional tolerable weekly intake (PTWI) established by JECFA) (Figure 1). In general, the risk of an adverse health effect due to ingestion of a substance is considered as acceptable when the dietary intake is lower than the safety reference value.

According to the food consumption pattern of Hong Kong secondary school students and the levels of mercury in food determined by laboratory analysis, the estimated dietary intakes of mercury for average consumers and high consumers among secondary school students were all below the PTWI (Figure 2). The risk of adverse health effects due to dietary intake of mercury is therefore low for this group within the population.

圖二 食物環境衛生署就“中學生從食物攝取水銀的情況”進行的風險評估結果所得的中學生從食物中攝入水銀的分量(以%暫定每周可容許攝入量表示)

Figure 2. Dietary Exposure to Mercury among Secondary School Students Represented as a Percentage of PTWI Based on Results of Risk Assessment on “Dietary Exposure to Mercury in Secondary School Students” conducted by the Food and Environmental Hygiene Department



食物事故點滴

Food Incident Highlight

進食生或未經徹底煮熟的淡水水產的風險

因進食生或未經徹底煮熟的淡水水產而對健康造成不良影響的報道時有所聞。自今年六月起，北京已有百多人在進食生的福壽螺後感染寄生蟲。經調查後發現福壽螺中有一種名為“廣州管圓線蟲”的寄生蟲。在廣州，亦有報道市民因進食生的淡水魚而感染到肝吸蟲。

廣州管圓線蟲可入侵中樞神經系統，引致腦膜炎。至於肝吸蟲，則會寄生在膽管內，引致膽管發炎和膽管癌。

為免感染寄生蟲和其他病原微生物，消費者**不應進食生的魚、蝦、螺、蟹和田雞等淡水水產**，同時**應徹底煮熟這類食物**才進食。此外，他們亦應注意，酒、醋、青芥末、黃芥末和香料均不能殺死寄生蟲。在本港售賣中國菜式魚生(即供生吃的淡水魚)屬違法。

Danger of Eating Raw or Undercooked Freshwater Animals

Adverse health effects due to consumption of raw or undercooked freshwater animals are reported from time to time. Since June of this year, over a hundred people have been infected with parasites in Beijing after eating raw snails. Investigation found that the snails were infested with a parasite known as *Angiostrongylus cantonensis*. In Guangzhou, cases of *Clonorchis sinensis* parasitic infection were also reported due to the consumption of raw freshwater fish.

*Angiostrongylus cantonensis* may invade the central nervous system and lead to meningitis. *Clonorchis sinensis*, which stays and irritates the bile duct, is a risk factor for cancer of bile duct.

To avoid being infected with parasites and other pathogenic microorganisms, consumers **should not eat raw freshwater animals such as fish, shrimp, snail, crab and frog** and **should cook these food items thoroughly** before consumption. Consumers should also note that wine, vinegar, wasabi, mustard and spices cannot destroy the parasites. In Hong Kong, it is against the law to sell Chinese dishes Yu Sang (i.e. freshwater fish intended for raw consumption).



何謂事故/食物安全個案?

“風險傳達工作一覽”旨在反映中心在幾個重要範疇的工作，當中“事故/食物安全個案”一類是指本中心在過去一個月曾積極評估及跟進可能影響食物安全的事件或事故數目。這些事故或事件包括由本港以外的食物機關發出或傳媒機構作出可能影響本港的食物安全報告或報道，以及傳媒廣泛報道和市民極為關注的本地食物安全事宜。中心密切留意各方消息，評估有關消息對本港的影響，並採取跟進行動以處理可能發現的食物安全風險和問題。

What Constitutes an Incident/Food Safety Case?

The table “Summary of Risk Communication Work” aims to reflect the work of the CFS in a number of important areas. One of the areas, namely “Incidents/Food Safety Cases” refers to the number of incidents or events with potential food safety implications, and were actively evaluated and handled by the CFS in the past month. They include reports on food safety issues by food authorities and media agencies outside Hong Kong but may have local implications, as well as local food safety issues with wide media coverage and significant public concern. The CFS monitors the reports from a wide range of sources, assesses their local significance and takes follow up actions to address any food safety risk and concern that may be identified.

風險傳達  
工作一覽  
Summary of  
Risk Communication Work

風險傳達工作一覽 (二零零六年八月) Summary of Risk Communication Work (August 2006)	數目 Number
事故/食物安全個案 Incidents / Food Safety Cases	24
公眾查詢 Public Enquiries	47
食物投訴 Food Complaints	502
教育研討會/演講/講座/輔導 Educational Seminars / Lectures / Talks / Counselling	117
上載到食物安全中心網頁的新訊息 New Messages Put on the CFS Website	11