食物安全焦點
Food Safety Focus

食物安全中心 Centre for Food Safety

食物環境衞生署 Food and Environmental Hygiene Department

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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 Y.K. CHU, Scientific Officer,
Risk Assessment Section,
Centre for Food Safety

今年八月二十四日，傳媒報道有環保組織從本港超級市場抽取水果樣本進行除害劑測試，發現部分樣本含有殘餘除害劑。根據由有關超級市場提供的測試結果，所有含有殘餘除害劑的樣本均符合食品法典委員會採用的相關標準(即“最高殘餘限量”)。

On 24 August 2009, the media reported that an environmental campaign group took fruit samples from supermarkets in Hong Kong for pesticides testing and found that some samples contained pesticide residues. According to the results of the testing provided by concerned supermarkets, all samples containing pesticide residues complied with the corresponding standards (i.e. Maximum Residue Limits (MRLs)) adopted by the Codex Alimentarius Commission (Codex).

環保組織報稱的結果 Results reported by the environmental campaign group：

水果類別 Fruit type	多菌靈及苯菌靈 Carbendazim and benomyl (毫克/公斤;mg/kg)	毒死蜱 Chlorpyrifos (毫克/公斤;mg/kg)	吡蟲啉 Imidacloprid (毫克/公斤;mg/kg)
桃 Peach	0.11 (食品法典委員會釐定的最高殘餘限量為2) (Codex's MRL is 2)	0.15 (食品法典委員會釐定的最高殘餘限量為0.5) (Codex's MRL is 0.5)	0.01 (食品法典委員會釐定的最高殘餘限量為0.5) (Codex's MRL is 0.5)
梨果類水果(包括蘋果及梨) Pome fruits (including apple and pear)	0.01–0.06 (食品法典委員會釐定的最高殘餘限量為3) (Codex's MRL is 3)	-	-

根據測試結果，一名60公斤重的消費者可能需每天吃30公斤蘋果或梨(即超過75個蘋果或梨)，才會超出多菌靈的安全參考值(即“每日可攝入量”)。同樣，一名60公斤重的消費者可能需每天吃4公斤桃(即超過13個桃)，才會超出毒死蜱的安全參考值。

Based on the results of the testing, a 60-kg consumer may need to eat 30 kg apple or pear (i.e. more than 75 apples or pears) daily before exceeding the safety reference value (i.e. acceptable daily intake) of carbendazim. Similarly, a 60-kg consumer may need to eat 4 kg peach (i.e. more than 13 peaches) daily before exceeding the safety reference value of chlorpyrifos.

什麼是除害劑和為何使用除害劑？

除害劑是用來殺死或控制有害昆蟲、植物、真菌、老鼠或其他害蟲的物質。常用的除害劑包括除蟲劑、除草劑、殺鼠劑和除真菌劑。

多年以來，除害劑已在農務上使用，避免農作物受疾病和昆蟲侵害而造成浪費。此外，使用除害劑令食物可全年供應充足，質量更佳，種類更多，並能夠以現時的生產成本提供給消費者。再者，除害劑又可用來控制昆蟲、老鼠等各種害蟲及疾病媒介物，保障公眾健康。

雖然除害劑為我們帶來莫大好處，但使用除害劑亦有風險。聯合國糧食及農業組

What Are Pesticides and Why Are They Used?

Pesticides are substances used to kill or control unwanted insects, plants, fungi, rodents or other pests. Insecticides, herbicides, rodenticides and fungicides are some commonly used pesticides.

Pesticides have been used in agriculture for many years to prevent crops from being wasted by disease and infestation. Their use also provides the community with year-round availability of, and improved quality and variety in, our food supply, and leads to the production of food at a cost to the consumers that would otherwise not be possible. Pesticides are also used to protect public health by controlling various pests and disease carriers, such as insects, rats and mice.

Although pesticides present the community with significant benefits, there are risks associated with their use. The Joint Food and Agriculture Organization (FAO) and World Health Organization (WHO) Meeting on Pesticide Residues (JMPR) is responsible for evaluating the safety of pesticide and estimating

焦點個案 Incident in Focus

織／世界衛生組織農藥殘留聯合會議負責根據除害劑的已知毒性和從膳食攝入除害劑分量的數據，評估除害劑的安全性，以及估計每種除害劑的安全參照標準(即“每日可攝入量”)。除了除害劑的性質外，除害劑對人體健康的影響亦視乎食物中的除害劑分量和進食該種食物的頻密程度而定。

食物內可含有多少殘餘除害劑？

殘餘除害劑指在收割或貯存過程之後仍然殘留在農作物內或農作物表面上的微量除害劑。即使在適當時間施用適當分量的除害劑，農作物仍會留有殘餘除害劑。

為保障消費者的健康和促進國際貿易，食品法典委員會為選定的食物釐定個別除害劑的最高殘餘限量。最高殘餘限量是指食物中允許的最高殘餘除害劑濃度。釐定最高殘餘限量的主要目的，是確保為防治蟲害而在食物施用的除害劑分量減至最少，以保障消費者的健康。最高殘餘限量是根據優良務農規範制定，通常遠低於會對人體健康造成影響的水平。有一點必須強調的是，只要從膳食攝入某種除害劑的分量低於安全參考值，攝入的殘餘除害劑即使超出最高殘餘限量，並不表示人類健康必定會受損。

注意要點

- 殘餘除害劑指在收割或貯存過程之後仍然殘留在農作物內或農作物表面上的微量除害劑。
- 為保障市民的健康，中心定期在市面上抽取食物樣本進行分析，監察殘餘除害劑的水平。
- 市民應保持均衡飲食和進食各種水果。

監管

在香港，食物環境衞生署轄下的食物安全中心(中心)負責監管所有食物的安全。中心推行食物監察計劃，並在進口、批發及零售層面定期抽取水果、蔬菜和穀類等食物樣本進行殘餘除害劑測試。現時，中心參考食品法典委員會釐定的最高殘餘限量。食物中的殘餘除害劑分量如低於食品法典委員會釐定的最高殘餘限量，有關食物可視為合乎衞生和適宜供人食用；如超出最高殘餘限量，則表示在施用除害劑方面有不足之處或食物已受污染。中心會採取適當的跟進行動。

中心已因應有關報道抽取了12個水果樣本(包括蘋果、梨及桃)進行殘餘除害劑分析，全部沒有驗出毒死蜱、多菌靈(多菌靈及苯菌靈的總和)及吡蟲啉。

給業界的建議

在施用除害劑保護農作物時，耕種者應遵從(包括但不限於)下列的優良務農規範建議：

(a) 只使用准許／註冊除害劑；

(b) 使用足以控制害蟲的最少分量；

(c) 盡可能把殘餘除害劑分量降至最低，令殘餘的毒性不超過可接受水平；

(d) 除非另外訂明，否則應由最後一次施用除害劑日期起計至少兩星期後才收割農作物。

如欲取得更多有關本港除害劑註冊和如何安全使用除害劑的資料，請登入漁農自然護理署網頁(網址：http://www.afcd.gov.hk)。

給市民的建議

1. 水果是健康飲食不可或缺的組成部分。市民應保持均衡飲食，進食各種水果，避免因偏食幾類食物而攝取過量的污染物。
2. 水果應徹底清洗才可進食。如市民希望進一步減低除害劑的攝入量，可削去水果的外皮才進食。

a safety reference (i.e. Acceptable Daily Intake (ADI)) for individual pesticide based on available toxicological and dietary exposure data. Besides the nature of the pesticide, the adverse health effects of the pesticide depend on the amount of pesticide in food and how often the food is consumed.

How Much Pesticide Residue Is Allowed in Food?

Pesticide residues are the very small amounts of pesticides that can remain in or on a crop after harvesting or storage. Pesticide residues can remain even when pesticides are applied in the right amount and at the right time.

In order to protect the health of the consumers while facilitating international trade, Codex has established MRLs for individual pesticide in selected commodities. MRL is the maximum concentration of a pesticide residue to be permitted in a food commodity. The primary objective of setting MRLs is to protect the health of consumers by ensuring that only the minimum amount of pesticide is applied to food for achieving the actual pest control needs. MRLs are based on good agricultural practice (GAP) and are usually well below the levels that would be of concern for people's health. It should be stressed that exposure to pesticide residue in excess of MRL does not automatically imply a hazard to health provided the dietary exposure to that particular pesticide falls within the safety reference value.

Key Points to Note

- Pesticide residues are the very small amounts of pesticides that can remain in or on a crop after harvesting or storage.
- To protect public health, CFS regularly takes food samples from markets for analysis to monitor the level of pesticide residues.
- Members of the public should take a balanced diet and eat a variety of fruits.

Regulatory Control

In Hong Kong, the Centre for Food Safety (CFS) of Food and Environmental Hygiene Department is responsible for the overall safety of food. CFS operates a food surveillance programme and regularly takes food samples, including fruits, vegetables and cereals at import, wholesale and retail levels for testing of pesticide residues. Currently, CFS makes reference to Codex's MRLs. Food containing residues within Codex's MRLs are considered wholesome and fit for human consumption. Those exceeding the MRLs may reflect deficiency in the practice of application of pesticides or contamination. CFS will take appropriate follow-up action.

In response to the report, CFS took 12 fruit samples (including apples, pears and peaches) for pesticide residue analysis. No chlorpyrifos, carbendazim (as sum of carbendazim and benomyl) and imidacloprid were detected.

Advice to the Trade

During the use of pesticide for crop protection, farmers should follow GAP which include but not limited to the following recommendations -

(a) Use only permitted/registered pesticides;

(b) Apply minimum quantities necessary to achieve adequate control;

(c) Leave residues that are the smallest amounts practical and that are toxicologically acceptable;

(d) Unless otherwise specified, the crops should not be harvested for at least 2 weeks after the last treatment.

For more information regarding the registration of pesticides in Hong Kong as well as the safe use of pesticides, please visit the Agriculture, Fisheries and Conservation Department's Website at http://www.afcd.gov.hk.

Advice to the Public

1. Fruits are an essential component of a healthy diet. Members of the public are advised to take a balanced diet and eat a variety of fruits so as to avoid excessive exposure to contaminants from a small range of food items.
2. Fruits should be washed thoroughly before consumption and for those who wish to further reduce their intake of pesticides, they may peel fruit before consumption.

食物安全平台
Food Safety Platform

動物複製與食物安全
Animal Cloning and Food Safety

食物安全中心
風險評估組
科學主任周淑敏女士報告

Reported by Ms. Shuk-man CHOW, Scientific Officer,
Risk Assessment Section,
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本欄已一連數期探討有關以基因工程生產食物的安全問題，今期有全新的生物科技主題 - 淺談動物複製*。

After discussing the safety concerns over the use of genetic engineering for food production in previous issues, we are going to start a new topic on another new biotechnology - animal cloning*.

多莉 - 全球首隻成功複製的哺乳類動物 Dolly - the world's first cloned mammal
[圖片來源 Source: Roslin Institute and Royal (Dick) School of Veterinary Studies of the University of Edinburgh]

動物複製

基因工程涉及改變某生物的基因構造，但動物複製則不然。動物複製是繁殖擁有與被複製動物完全相同遺傳特質的動物的一種技術，而當中並沒有刻意改變動物的基因物質。全球首隻成功複製的哺乳類動物是一隻綿羊，名叫多莉，在一九九六年於蘇格蘭出生。自多莉面世後，牛、豬、山羊、貓及狗等多種不同動物亦相繼被複製。

為什麼要複製動物？

傳統育種方法和其他人工輔助繁殖技術已使用了一段時間，以改善飼養動物的質量。不過，傳統育種方法較費時和有局限性，一些優良特性可能會在繁衍過程中減弱或消失，而複製技術則可繁殖出擁有被複製動物所有優良基因特性的動物。此外，複製技術亦有助飼養人保留具有優良特性但繁殖力低的稀有瀕危品種，為他們提供更多優良動物，從而提高牧羣的質量。

對動物複製的關注

動物健康與福利

一般而言，動物複製技術的成效偏低，大部分複製胚胎會出現各種產前問題。此外，成功複製的動物亦往往在出生時有較多健康問題，並可能較易一出生就夭折。即使成功複製的動物存活下來，牠們的壽命亦較並非以複製技術繁殖的同類為短。

食物安全

此外，複製過程可能會改變基因的表達，以致衍生自複製動物的食物在成分組合上可能有別於來自一般動物的食物。

* 動物複製一般是指"體細胞核移植技術"。在進行這項技術時，科研人員會把包含了某動物基因物質的細胞核從未受精卵子中移除，換入擬複製動物的體細胞核。在經過其他步驟後，胚胎便會形成，科研人員再把胚胎移植往代母子宮內，讓其發育至出生為止。

Animal Cloning

Different from genetic engineering which involves the modification of an organism's genetic make-up, animal cloning is the technology of producing a genetically identical copy of an animal without any intentional changes in the genetic materials. The world's first cloned mammal was a sheep named Dolly born in 1996 in Scotland. Since the appearance of Dolly, a number of other animals such as cattle, pigs, goats, cats and dogs were also cloned.

Why Are Animals Cloned?

Conventional breeding and other techniques assisting reproduction have been used for some time to improve the quality of domestic animals. However, conventional breeding is relatively time-consuming and limited in that desirable traits may be diminished or diluted out in subsequent generations. Cloning, however, allows the reproduction of animals that have all the desired genetic characteristics of the parent. Cloning can also help farmers to preserve rare and endangered varieties with desired traits but poor fertility. These allow farmers to upgrade the quality of their herds by providing more copies of their best animals.

Concerns over Animal Cloning

Animal health and welfare

In general, animal cloning is relatively inefficient and a large proportion of clones will result in pre-natal difficulties. Cloned animals also tend to have more health problems at birth and may be more likely to die right after birth. Even the clones survive, they are found to have a shorter life span than their non-clone counterparts.

Food safety

In addition, changes in gene expression, which may be introduced during the cloning process, may lead to a difference between the composition of food products derived from cloned animals and that derived from the ordinary animals.

* Animal cloning is commonly referred to as somatic cell nuclear transfer (SCNT). In SCNT, the nucleus, which contains the genetic material of an animal, is removed from an unfertilised egg and replaced with the nucleus of a body (somatic) cell from the animal to be cloned. After other steps in the laboratory, the embryo is formed and transferred to a surrogate mother where it develops in the womb until birth.

衍生自複製動物及其後代的食物的安全評估

近期，多個國家／地區當局根據經同業評核的科學數據，就衍生自複製動物及其後代的食物的安全性進行評估。大體而言，目前並無證據顯示衍生自複製動物及其後代的食物的食用風險高於來自傳統育種動物的食物。此外，美國食物及藥物管理局亦指，來自複製牛隻、豬隻及山羊的肉及奶，以及傳統作為食物的任何品種的複製動物的後代，與來自傳統育種動物的食物同樣安全。

就目前來看，動物複製是十分昂貴的程序，因此把複製動物直接用作食物的機會不大。相反，這類動物會用作配種動物，繁殖作為食用動物的後代。不過，當複製動物再無商業價值時，終有一天亦會像傳統飼養的動物一樣成為人們的食物。

以生物科技生產食物一向被視為“人工化”或“不夠天然”。我們將會在下一期介紹有機耕作這種“較天然”的食物生產方法及相關的食物安全事宜。

Safety Assessment of Food Derived from Cloned Animals and Their Offspring

Recently, safety of food derived from cloned animals and their offspring has been evaluated by a number of national/regional authorities based upon peer-reviewed scientific data. In general, there is no evidence that consumption of food products from cloned animals or their offspring pose a greater risk than consumption of products from conventionally bred animals. The U.S. Food and Drug Administration (FDA) has also pointed out that meat and milk from clones of cattle, pigs and goats, and the offspring of clones from any species traditionally consumed as food, are as safe as food from conventionally bred animals.

At this time, cloning an animal is an expensive process and therefore it is unlikely that clones will be used directly as food. Rather, they are used as breeding stock to sexually reproduce offspring which become the food-producing animals. However, just like conventionally farmed animals, cloned animals may enter the food chain one day when their commercially productive lives come to the end.

The application of biotechnology to food production has always been perceived as something "artificial" or "less natural". In the coming issue, we are going to introduce the "more natural" means of food production through organic farming and the safety of food derived from this agricultural practice.

食物事故點滴
Food Incident Highlight

巴西蘑菇中的鎘

今年七月，一批從中國內地進口往台灣的巴西蘑菇被驗出鎘含量超標。

鎘是天然存在於地殼表面的金屬元素，亦可透過電鍍、生產鎳鎘電池及肥料等工業活動釋出。食物是非吸煙者攝取鎘的主要來源，而煙草則是吸煙者攝取鎘的主要途徑。從飲食中攝取鎘絕少會引致急性中毒。至於慢性鎘中毒方面，關注重點是鎘會損害腎臟。

長期食用鎘含量偏高的食物或會影響健康。因此，食物安全中心建議市民保持均衡飲食，避免因偏食幾類食物而攝取過多污染物。此外，另一個良好習慣是在烹煮蔬菜前先用清水浸泡一小時和徹底洗淨。

Cadmium in Brazil Mushroom

In July, excessive level of cadmium was detected in a batch of Brazil mushroom imported to Taiwan from Mainland China.

Cadmium is a metallic element that occurs naturally in the earth's crust. It can be released to the environment by industrial activities, such as electroplating, manufacture of nickel-cadmium batteries, production of fertilizers, etc. For non-smokers, food is the main source of cadmium. However, for smokers, tobacco smoke is an important source of exposure of cadmium. Intake of cadmium from the diet rarely causes acute toxicity. As for chronic toxicity of cadmium, the main concern is its adverse effects on the kidneys.

Prolonged consumption of foods with excessive level of cadmium may cause adverse effects. Therefore, the Centre for Food Safety advises the public to consume a balanced diet to avoid excessive exposure to contaminants from a small range of food items. Furthermore, another good practice is to soak and wash vegetables in clean water for one hour before cooking.

有關自助餐的食物中毒事故

食物安全中心在上個月接獲衞生防護中心通知，本港發生四宗有關自助餐的大型食物中毒事故。逾50人在兩間酒店享用自助餐後出現病徵。在事故中，懷疑引致中毒的食物包括生蠔、刺身及即食冷盤，而懷疑致病媒介則是副溶血性弧菌、沙門氏菌及諾如病毒。

預防由食物傳播疾病的關鍵是嚴格奉行食物、個人及環境衞生守則。在處理和進食自助餐的壽司、刺身、生蠔及即食冷盤時，應遵守「食物安全五要點」，以預防由細菌及病毒引起的食物中毒。業界應：(1)從可靠的來源*選擇*食物材料並檢查其品質；(2)保持雙手及用具*清潔*；(3)*分開*生的食物和經煮熟或即食食物；(4)徹底*煮熟*食物；以及(5)把冷吃食物存放於*安全溫度*(即攝氏4度或以下)。

Food Poisoning Outbreaks Related to Buffets

Last month, the Centre for Food Safety was notified of four major food poisoning outbreaks related to buffets by the Centre for Health Protection. Over 50 persons developed symptoms after having buffets at two hotels. In these cases, oysters, sashimi and ready-to-eat cold dish were the suspected food items. *Vibrio parahaemolyticus*, *Salmonella* and norovirus were the suspected causative agents.

The key to the prevention of foodborne diseases is the strict observance of food, personal and environmental hygiene. When handling and consuming sushi, sashimi, raw oysters and ready-to-eat cold dish in buffets, the Five Keys to Food Safety should be followed to prevent food poisoning caused by bacteria and viruses. The trade is advised to: (1) *choose* raw materials from reliable sources and check their quality; (2) keep hands and utensils *clean*; (3) *separate* raw and cooked food or ready-to-eat food; (4) *cook* food thoroughly; and (5) keep cold foods at *safe temperature* i.e. at or below 4°C.

風險傳達工作一覽
Summary of Risk Communication Work

風險傳達工作一覽（二零零九年八月） Summary of Risk Communication Work (August 2009)	數目 Number
事故/食物安全個案 Incidents / Food Safety Cases	60
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