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本期內容 IN THIS ISSUE

焦點個案

農作物含除害劑殘餘之解讀

食物安全平台

再談貝類毒素

食物事故點滴

薄餅原材料發現未有標示致敏物

新鮮蔬菜中的甲醛

風險傳達工作一覽

Incident in Focus

Understanding Pesticide Residues in Crops

Food Safety Platform

More on Shellfish Poisoning Toxins

Food Incident Highlight

Undeclared Food Allergen Found in Pizza Ingredient

Formaldehyde in Fresh Vegetables

Summary of Risk Communication Work

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焦點個案 Incident in Focus

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食物安全中心

風險評估組

科學主任莊梓傑博士報告

Reported by Dr. Ken CHONG, Scientific Officer,

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一綠色團體在四月及五月期間，發表連串報告，指在內地和香港抽取的蔬菜、茶葉和茶包等檢出多種除害劑(又稱農藥)殘餘，有些更是內地禁用的除害劑，並認為濫用除害劑問題嚴重。農作物含除害劑殘餘，對公眾健康有什麼影響呢？這期我們會深入探討這個問題。

除害劑“殘餘”及其安全評估

時至今日，現代農業仍以用除害劑防治害蟲為主流做法。農民如嚴格遵從優良務農規範的規定，正確施用除害劑，便可確保食物中的除害劑殘餘水平降至最低。一般來說，法規所定的「最高殘餘限量」是指食品和農產品中法定允許的最高除害劑殘餘濃度，是根據優良務農規範所得的田間試驗數據為不同“除害劑-食物”組合制定的限量標準。國際方面，食品法典委員會轄下的“農藥殘留法典委員會(CCPR)”負責根據聯合國糧食及農業組織(糧農組織)/世界衛生組織(世衛)農藥殘留聯合會議的建議，釐定食物中除害劑的標準，其中包括最高殘餘限量。

除害劑殘餘是否安全，我們會參考基於科學研究而制定的安全參考值。安全參考值主要是根據除害劑化學品在動物實驗中的毒性而制定。一種除害劑的安全參考值是指以體重計，攝入該除害劑而不致對健康帶來不良影響的分量。安全參考值一般會有較大的安全容差，亦包含長期攝取量的基準。例如每日可攝取量就是用來評估慢性影響的安全參考值。如果人在一生中每日從膳食中攝取的除害劑殘餘分量低於該除害劑的每日可攝取量，就不會對健康造成影響。世衛已就世界各地常用的除害劑訂立了安全參考值。

食物中檢出的除害劑殘餘分量超逾其相應的最高殘餘限量，並不一定代表會超出有關的安全參考值。要評估從膳食中攝入某種除害劑殘餘的健康

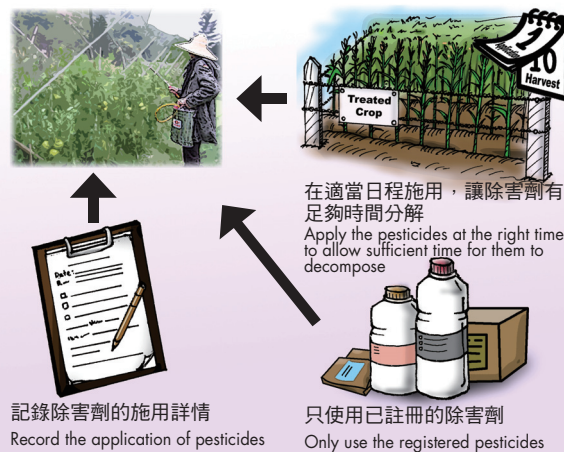
In April and May, a green group announced a series of reports alleging that multiple pesticide residues, including some that were prohibited in the Mainland, were detected in vegetables, loose tea leaves and tea bags collected in the Mainland and Hong Kong, and considered pesticide abuse was a serious problem. What are the public health implications if pesticide residues are found in crops? In this issue, let's take a closer look into this subject.

Pesticide “RESIDUES” and Their Safety Assessment

To-date, the use of pesticides for effective pest management remains the prevalent practice of modern agriculture. The application of pesticides in a way strictly follows Good Agricultural Practice (GAP) can ensure the levels of pesticide residues in food as low as practicable. In general, Maximum Residue Limits (MRLs) stipulated in law are the maximum concentrations of pesticide residues to be legally permitted in or on food and agricultural commodities. They are set for individual pesticide-food pairs, established by field trials using GAP. Internationally, the Codex Committee on Pesticide Residues, under the Codex Alimentarius Commission, is charged to set standards including MRLs for pesticides in foods based on the recommendation of the Joint Food and Agriculture Organization (FAO) / World Health Organization (WHO) Meeting on Pesticide Residues.

Regarding the safety aspect of pesticides, we will make reference to the safety reference values established based on scientific studies. The safety reference values are set based primarily on the toxic nature of the pesticide chemicals in animal models. The safety reference value of a pesticide is the amount of pesticide intake (per body weight) below which adverse health effects are unlikely to occur. The safety reference values usually have large safety margins and they also include benchmarks for prolonged exposure. For example, Acceptable Daily Intake (ADI) is a chronic safety reference value. The life-long consumption of food with pesticide residue below its ADI would be unlikely to cause adverse health effects. The WHO has set safety reference values for pesticides commonly used worldwide.

Pesticide residue level in a food item found exceeding its corresponding MRL does not automatically mean that the respective safety reference value would be exceeded. The dietary health risk of a pesticide



根據優良務農規範正確使用除害劑，可將食物中所含除害劑殘餘減到最低。

Proper use of pesticides in accordance with Good Agricultural Practice (GAP) can reduce the levels of pesticide residues in food to minimal levels.

焦點個案
Incident in Focus

風險，便須把從食物裡攝入該種除害劑的整體攝取量與其有關的安全參考值對照。事實上，根據田間試驗數據所制定的最高殘餘限量通常會訂在一個非常安全的水平，食物中除害劑殘餘的實際分量通常遠低於其最高殘餘限量。在一般情況下，即使偶爾吃下的食物含有超出最高殘餘限量的除害劑殘餘，也不會有即時的健康風險。總而言之，食物的除害劑殘餘量只要低於最高殘餘限量就是安全的，可以放心食用。

多種除害劑殘餘

食物含多種除害劑殘餘的原因有很多。舉例來說，當局經常鼓勵農民交替使用不同化學類別的除害劑，用以防止害蟲產生抗藥性。在農作物不同的生長階段，農民也會針對不同的蟲害使用不同的除害劑。上述兩者都是農業生產過程中的正常作業，但所收穫的農產品均可能會檢出多種除害劑殘餘。從風險評估的角度來看，假如多種除害劑裡每種除害劑的攝取量均低於其安全參考值，對健康是沒有影響的。

至於“施用禁用除害劑”一說，我們必須注意，有些除害劑雖然被禁止用於某些農作物，但用於其他農作物是允許的。換言之，禁用規定只適用於特定的“除害劑—食物”組合。有關樣本檢出除害劑殘餘，未必就是有人公然違反禁令的結果。要找出造成污染的源頭，仍需進一步調查。

跟進行動

有關本文開始時所提到的報告，中心已對其檢測結果進行評估，並從有關商戶抽取了蔬菜樣本化驗除害劑殘餘，結果全部合格。中心會繼續向內地當局了解和跟進。

食物安全中心設有食物監察計劃，保障市民健康。近年，除害劑殘餘監察計劃的結果一直非常理想。由二零零九年一月至二零一二年三月，中心檢測了超過57 000個樣本，只有四個不合格。然而，我們絕不會因此而鬆懈。政府已加強對食物內除害劑殘餘的規管。立法會剛通過了《食物內除害劑殘餘規例》（《規例》），本港食物中的除害劑殘餘含量將全面受到規管。《規例》將於兩年多寬限期後，即二零一四年八月一日起實施。

注意要點：

1. 國際上容許食物中含有分量不會危害健康的除害劑殘餘。
2. 嚴格遵從優良務農規範的規定施用除害劑，可將食物中的除害劑殘餘減到最低。
3. 為加強保障公眾健康，政府已制定規例，訂明最高殘餘限量，更有效地管制食物內的除害劑殘餘。

給業界的建議

- 遵從優良務農規範的規定施用除害劑，在防治害蟲之餘，確保把食物中的除害劑殘餘水平盡量降至最低。

給消費者的建議

- 注意均衡飲食，進食各種蔬果，喝多種茶，以免因只進食某幾類食物而攝入過量除害劑殘餘。
- 若干除害劑殘餘可以用沖洗的方法大量去除，以下方法可以減低風險：
 - 在流動的清水下把蔬菜沖洗，然後把蔬菜泡在清水中一小時，再沖洗一遍，才作進一步烹調工序。
 - 在沖飲前，可先用水沖洗茶葉或茶包。

residue is assessed by comparing the overall intake of the residue in food to the respective safety reference value. MRLs are very conservative estimates of pesticide residue levels in food based on GAP and the actual residual levels in food are often substantially lower than the MRLs. Occasional exposure to pesticide residue levels above their MRLs will not cause immediate health risk under normal situations. Simply speaking, food detected with pesticide residues below MRLs is safe for consumption.

Multiple Pesticide Residues

The presence of multiple pesticide residues in food may arise from many causes. For example, alternating use of pesticides of different chemical groups is often recommended to prevent the build-up of pesticide resistance. Different pesticides may also be applied at different growing stages of a crop for controlling different target pests. Both are normal agricultural practices likely to result in the detection of multiple pesticide residues in the final produce. From the risk assessment perspective, multiple pesticide residues should not raise health concern if their respective exposures are below their respective safety reference values.

As for the claim on "non-permitted pesticides", it should be noted that some pesticides are prohibited from use in certain crops but not in all kinds of crops, i.e. the prohibition applies to specific "pesticide-food" pairs. The pesticide residues detected in the samples concerned may not be a result of blatant violation of prohibition. Further investigation would be required to reveal the potential sources of contamination.

Follow-up Actions

With regards to the reports of the green group, the CFS had evaluated their testing results and took samples of vegetables from relevant vendors for testing of pesticide residues. All results were satisfactory. The CFS will liaise with the Mainland authorities for follow-up actions.

The CFS has in place vigorous surveillance programmes for food commodities to safeguard public health. In recent years, the results of the CFS's pesticide residues surveillance programme have been highly satisfactory. From January 2009 to March 2012, more than 57 000 samples were tested and only four unsatisfactory results were recorded. Nevertheless, there is absolutely no room for complacency. The Government has further stepped up its efforts to regulate pesticide residues in food. The Legislative Council has recently passed a pesticide residue in food regulation which provides comprehensive control of pesticide residues in food in Hong Kong. The regulation will come into operation on 1 August 2014 after a grace period of some two years.

Key Points to Note:

1. The international communities allow the presence of pesticide residues in food at levels that are unlikely to pose risks to human health.
2. The application of pesticides in a way strictly follows GAP can reduce the levels of pesticide residues in food to minimal levels.
3. The Government introduced a regulation specifying MRLs for effective control of pesticide residues in food to further enhance the protection of public health.

Advice to Trade

- Observe GAP to ensure that only the minimum amount of pesticide is applied to food for achieving pest control need.

Advice to Consumers

- Take a balanced diet and eat a variety of vegetables and fruits, and drink a variety of tea so as to avoid excessive exposure to pesticide residues from a small range of food items.
- Some pesticide residues can be removed substantially by washing and the risk can be reduced by:
 - Wash vegetables well in clean running water, soak in water for one hour and then rinse before further preparation.
 - Rinse loose tea leaves or tea bags with water before use.

再談貝類毒素

More on Shellfish Poisoning Toxins

食物安全中心
風險評估組
科學主任游天頌先生報告
Reported by Mr. Arthur YAU, Scientific Officer,
Risk Assessment Section,
Centre for Food Safety



我們一連三期介紹由微小生物（如浮游生物）產生，並影響海產安全的海洋毒素。上一期我們介紹了**麻痹性貝類中毒**，本文是此系列的完結篇，這次我們會探討另外四種貝類毒素。

其他貝類毒素

除了上一期介紹的麻痹性貝類毒素外，還有四種貝類毒素是較為世界各地的貝類業界、科學界和規管機構所熟知的，它們分別是**下痢性貝類毒素**、**失憶性貝類毒素**、**神經性貝類毒素**和**原多甲藻酸貝類毒素**。

This is the last article of a series of three that focuses on marine toxins originating from minute organisms (e.g. planktons) which can affect seafood safety. In the last issue, we discussed about the **paralytic shellfish poisoning (PSP)**. We will talk about four other shellfish poisoning toxins in this article.

Other Shellfish Poisoning Toxins

Other than the paralytic shellfish poisoning that we discussed in the last issue, there are four other shellfish poisoning toxins that are more commonly known to the shellfish trade, scientific and regulatory communities worldwide. They are namely **diarrhoeic shellfish poisoning (DSP)**, **amnesic shellfish poisoning (ASP)**, **neurologic shellfish poisoning (NSP)** and **azaspiracid shellfish poisoning (AZP)**.

表一：下痢性貝類中毒、失憶性貝類中毒、神經性貝類中毒及原多甲藻酸貝類中毒的特徵

Table 1: Features of DSP, ASP, NSP and AZP toxins

	下痢性貝類中毒 Diarrhoeic Shellfish Poisoning (DSP)	失憶性貝類中毒 Amnesic Shellfish Poisoning (ASP)	神經性貝類中毒 Neurologic Shellfish Poisoning (NSP)	原多甲藻酸貝類中毒 Azaspiracid Shellfish Poisoning (AZP)
產生毒素的浮游生物 Planktons producing the toxins	雙鞭毛藻(又名甲藻) Dinoflagellates	矽藻 Diatoms	雙鞭毛藻(又名甲藻) Dinoflagellates	雙鞭毛藻(又名甲藻) Dinoflagellates
致病毒素 Toxins involved	岡田酸 Okadaic acid 扇貝毒素 Pectenotoxins 蝦夷扇貝毒素 Yessotoxins	軟骨藻酸 Domoic acid	短裸甲藻毒素 Brevetoxins	原多甲藻酸 Azaspiracid
毒素特性 Properties of the toxins	耐熱及親脂 Heat-stable and lipophilic	溶於水 Water-soluble	既耐熱又耐酸；溶於脂肪 Heat and acid stable, lipid soluble	相對穩定 Relatively stable
中毒症狀 Symptoms of poisoning	腹瀉、嘔心、嘔吐和腹痛等 Diarrhoea, nausea, vomiting and abdominal pain	嘔吐、腹部痙攣、腹瀉、頭痛和短暫喪失記憶力等 Vomiting, abdominal cramps, diarrhoea, headache and loss of short term memory	症狀與麻痹性貝類中毒相似：頭部和手腳感覺異常、頭暈、動作機能不協調、肌肉痛和腸胃不適等 Symptoms are similar to PSP: paresthesias around the head and the extremities, dizziness, ataxia, muscle pain and gastrointestinal symptoms	症狀與下痢性貝類中毒相似：嚴重腹瀉、嘔吐、腹痛、間歇性嘔心和發冷等 Symptoms are similar to DSP: severe diarrhoea, vomiting, abdominal pain & occasional nausea, chills etc.
進食後出現症狀的時間 Time for symptoms to appear after consumption	半小時至數小時 Half to a few hours	15分鐘至38小時，中位數為5.5小時 15 minutes to 38 hours, median 5.5 hours	半小時至3小時 Half to three hours	12至24小時 12 to 24 hours
受影響的海產 Seafoods affected	青口、帶子、蠔、蜆、鱈魚 Mussels, scallops, oysters, clams, cod	青口、蜆、蠔子、帶子、腹足類動物、蟹、龍蝦、鯉魚 Mussels, clams, razor clams, scallops, gastropods, crabs, lobsters, anchovies	蠔、蜆、青口、司蚶、魚類 Oysters, clams, mussels, cockles, fish	青口、蠔 Mussels, oysters
產生毒素的浮游生物的主要分布水域 Common distribution of the toxin-producing planktons	全球 Global	全球 Global	廣泛分布於各個水域(包括香港) Widely distributed, including Hong Kong	愛爾蘭 Ireland

減低貝類中毒機會的方法

為減低貝類毒素的致病風險，部分地區的養殖業者在收採貝類後會作淨化處理（在特定的條件下，把貝類置於清潔的水中進行淨化的過程）。但是，由於淨化的效果受貝類和毒素的品種，以及淨化的條件和預期作用等多個因素影響，此舉並不能保證貝類已不具毒素風險。另一方面，定期監察貝類養殖場和撈捕水域等預防措施，有助控制食用貝類中貝類毒素的致病風險。業界應向可靠的供應商採購貝類。此外，如有海域受到產生貝類毒素的微生物影響，從這些海域採捕的貝類亦不宜購入。

Ways to Reduce the Chance of Shellfish Poisoning

Although depuration of harvested shellfish (the process of purifying shellfish in clean water under specific conditions) is practised in certain regions, it does not guarantee shellfish are free of toxins as the effect of depuration is affected by numerous factors, including the species of shellfish and toxins involved, as well as the condition and intended effect of depuration. Regular monitoring of shellfish farming and harvesting areas are preventive measures to control the effect of shellfish poisoning toxins in shellfish harvested for human consumption. The trade should source shellfish from reliable suppliers and avoid obtaining shellfish collected from areas that have been affected by shellfish poisoning organisms.

貝類毒素一般積聚於貝類的消化腺和生殖腺，市民應避免進食這些部位。食用雙貝類時，在容許的情況下應去除全部內臟，只食用閉殼肌，烹煮的汁液也應棄掉。此外，應向可靠的店鋪購買貝類，烹煮前先刷洗外殼。進食亦不宜過量。

Consumers should avoid consuming the digestive and reproductive glands of shellfish where much of the toxins often concentrate. Where possible, all organs of bivalves should be discarded and only the adductor muscles should be consumed. The cooking liquid should also be abandoned. One should always buy shellfish from reliable sources, and scrub and clean the shells thoroughly before cooking. Overindulgence in shellfish should be avoided.

食物事故點滴
Food Incident Highlight

薄餅原材料發現未有標示致敏物

二零一二年五月二日，食物安全中心（中心）發出首宗食物致敏物警報，一款預先包裝薄餅原材料經檢測證實含奶類蛋白質，但包裝上的標籤未有標示相關資料，中心建議對奶類蛋白質過敏的人士停止食用有關產品。此外，中心已通知業界停止出售該產品。

Undeclared Food Allergen Found in Pizza Ingredient

On 2 May 2012, the Centre for Food Safety (CFS) issued the first food allergen alert to advise consumers allergic to milk proteins to stop eating a prepackaged pizza mix product since milk protein was found to be present but not listed on the food label. The trade was notified immediately to stop selling the product.

食物致敏物指可引致食物過敏症的食物，此症可令過敏人士出現免疫反應。對奶類蛋白質過敏的人士進食含有該物質的食物後，會出現嘔吐、腹瀉和出疹等症狀，嚴重的甚至會引起過敏性休克。

Food allergens are food that can cause food allergies, where they cause an immunologic response in sensitive individuals. People who are allergic to milk protein may develop symptoms like vomiting, diarrhoea and rash upon consumption and in severe cases anaphylactic shock.

在本港，根據《食物及藥物（成分組合及標籤）規例》的規定，如預先包裝食物含有八種指明的致敏物（亞硫酸鹽；含有麩質的穀類；甲殼類動物；蛋類；魚類；奶類；木本堅果；花生、大豆及它們的製品），須在標籤上標明。由二零一二年四月起，中心會在每月報告刊登致敏物檢測結果，公布含未有標示致敏物的預先包裝食物樣本詳情。患有食物過敏症人士宜留意中心網頁上發出的食物警報，亦可訂閱中心的食物安全電子信息，通過電郵獲取最新的食物警報。

In Hong Kong, all prepackaged food are required to indicate the presence of the eight specified allergens (sulphite, cereals containing gluten, crustaceans, eggs, fish, milk, tree nuts, peanuts, soybeans and their products) according to the requirements of the Food and Drugs (Composition and Labelling) Regulations. Starting from April 2012, compliance test results of prepackaged food samples with allergens detected but undeclared are published in the CFS Monthly Report. Individuals with food allergies are advised to take note of future alerts issued on the CFS website and to subscribe to E-news to receive e-mail notifications.

新鮮蔬菜中的甲醛

最近有傳媒報道，內地菜販使用甲醛令大白菜在運送途中保持新鮮。由於本港禁止在食物中添加甲醛，所以食物安全中心隨即在本港市場抽取蔬菜樣本作化驗，全部沒有驗出甲醛。

Formaldehyde in Fresh Vegetables

Following recent media reports on the use of formaldehyde, a chemical not permitted for use in food in Hong Kong, to keep Chinese cabbage in transit fresh in the Mainland, the Centre for Food Safety has collected vegetable samples from the local market for testing. All samples were found negative for formaldehyde.

甲醛是一種化學物，主要用以生產塑膠樹脂，亦會應用於除真菌劑或加入化妝品作為防腐劑。甲醛雖不是法例中容許使用的食物添加劑，但由於它是正常新陳代謝過程中的產物，大部分未經烹煮的食物都含有少量甲醛，這些食物包括水果和蔬菜、肉類、魚類、甲殼類動物和乳製品等。吃下少量甲醛不會造成急性中毒。另外，由於甲醛可溶於水中，並且極易揮發，市民在進食前先把蔬菜浸泡清洗乾淨，並徹底煮熟，便可減低風險。而業界則不應在食物內添加甲醛。

Formaldehyde is a chemical used mainly for the production of plastic resins but can also be used as fungicides or preservatives in cosmetics. Although formaldehyde is not a permitted food additive according to the regulations, it occurs as a natural metabolic intermediate at low levels in a wide range of raw foods including fruits and vegetables, meat, fish, crustacean, dairy products, etc. Ingestion of small amount of formaldehyde is unlikely to cause any acute effects. Furthermore, since formaldehyde is soluble in water and highly volatile, as a precautionary measure, consumers are advised to thoroughly wash and soak vegetables in water and adequately cook them before consumption. Also, traders should not add formaldehyde to food.

風險傳達
工作一覽
Summary of
Risk Communication Work

風險傳達工作一覽（二零一二年五月） Summary of Risk Communication Work (May 2012)	數目 Number
事故/食物安全個案 Incidents / Food Safety Cases	85
公眾查詢 Public Enquiries	143
業界查詢 Trade Enquiries	202
食物投訴 Food Complaints	524
給業界的快速警報 Rapid Alerts to Trade	24
給消費者的食物警報 Food Alerts to Consumers	2
教育研討會/演講/講座/輔導 Educational Seminars / Lectures / Talks / Counselling	77
上載到食物安全中心網頁的新訊息 New Messages Put on the CFS Website	53