

食物安全焦點

Food Safety Focus



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Centre for Food Safety

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Vibrio vulnificus in food

食物安全中心

風險評估組

科學主任馬嘉明女士報告

Reported by Ms. Janny MA, Scientific Officer,
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二零一二年六月，衛生署轄下的衛生防護中心接獲兩宗感染創傷弧菌的死亡個案，其中一宗引致壞死性筋膜炎(又稱“食肉菌感染”)。壞死性筋膜炎是一種嚴重的細菌感染，能迅速蔓延並引致身體軟組織壞死。資料顯示兩人均是長期病患者，其中一人曾進食生的瀨尿蝦。本文將探討創傷弧菌及相關的食物風險。

創傷弧菌

創傷弧菌是一種天然棲息於和暖的海水和河口中的細菌。尤其是在夏季，在這些水域生長的海產中不難發現這種細菌的存在。蠔等雙殼貝類軟體動物更可能含大量創傷弧菌，因為這些動物以過濾方式進食，海水中的細菌會在其體內積聚。

雖然由創傷弧菌引致的疾病較為罕見，至今世界各地尚未有與其有關的食源性事故報告，但這種細菌主要對長期病患者，尤其是肝病或酗酒人士、糖尿病、血色素沉着病和愛滋病患者有嚴重的健康威脅。

創傷弧菌引起的感染

創傷弧菌可藉由食物或傷口造成感染。進食生的或未經煮熟的受污染海產或傷口接觸到海水的人士，包括處理生的海產時遭割傷和有外露傷口等，都有可能受到感染。

食源性創傷弧菌感染的潛伏期介乎12小時至數天左右。一般來說，健康人士從食物中感染創傷弧菌較為罕見，但可偶爾引致發燒、嘔吐、腹瀉及腹痛等自行痊癒的腸胃炎症狀。然而，這種細菌可在上文提及的長期病患者身上引起原發性敗血症(血液感染)——一種十分嚴重且往往致命的疾病。

另一方面，無論是健康或高危人士都有可能因創傷弧菌而造成傷口感染，但後者出現血液感染及致命併發症的風險較高。感染症狀最快可於四小時內出現。

敗血症和傷口感染的平均死亡率分別約為35%和20%。及時施以抗生素治療有助提高創傷弧菌感染的存活率。患者因敗血症而出現繼發性病變或由傷口直接感染創傷弧菌多須接受截肢手術，即使能夠存活下來也須長期住院治療。

In June 2012, two fatal *Vibrio vulnificus* infection cases, including one causing necrotizing fasciitis (also known as flesh-eating disease), a serious bacterial infection that spreads rapidly and destroys the body's soft tissue, were reported to the Centre for Health Protection (CHP) of the Department of Health. Available information showed that both patients had underlying medical conditions and one of them had consumed raw mantis shrimp. In this article, we are going to talk about *Vibrio vulnificus* and its food-related risk.

Vibrio vulnificus

V. vulnificus is a bacterium naturally found in warm seawaters and estuaries. It is not surprising to find this bacterium in seafood that grows in these waters especially during summer months. High levels of *V. vulnificus* may even be present in bivalve molluscs like oysters due to their filter feeding activity that concentrates bacteria in water.

Although illnesses caused by *V. vulnificus* are relatively rare, with no foodborne outbreaks have ever been reported worldwide, this bacterium is a serious health threat predominantly to those with underlying chronic diseases, particularly liver disease or alcoholism, diabetes, haemochromatosis and HIV/AIDS.

Infections Caused by *V. vulnificus*

V. vulnificus infections are either foodborne or wound-associated. People may contract the disease by eating contaminated raw or undercooked seafood or by exposure to seawater through an existing open wound or puncture wound caused by handling raw seafood.

Incubation period of foodborne *V. vulnificus* illness ranges from twelve hours to several days. In general, foodborne infection in healthy individuals is rare, but *V. vulnificus* can occasionally cause self-limiting gastroenteritis characterised by fever, vomiting, diarrhoea and abdominal pain. Nevertheless, the bacterium can cause primary septicæmia (blood infection), a serious and often fatal disease, in susceptible individuals as stated above.

On the other hand, wound infection caused by *V. vulnificus* can occur in both healthy and susceptible individuals, while the latter are at higher risk for invasion of the bacteria into the bloodstream and potentially fatal complications. The symptoms may appear within as few as four hours.

The average fatality rate of septicæmia cases and wound-infection cases is about 35% and 20% respectively. Prompt antibiotic treatment improves survival in *V. vulnificus* infection cases. Secondary lesions from septicæmia and primary wound infections caused by direct contact frequently require amputation. People who survive these bloodstream infections may require prolonged hospitalisation.

焦點個案
Incident in Focus

本港情況

由二零零七年至二零一二年六月期間，衛生防護中心共接獲106宗創傷弧菌感染報告，其中45宗於血液培養出創傷弧菌。在72宗感染後患上壞死性筋膜炎的病例中，59人(佔82%)有長期病患或免疫系統較弱。約半數壞死性筋膜炎的病人須接受截肢手術。關於感染創傷弧菌而引致壞死性筋膜炎的風險因素，在72名病人中，51人(佔71%)表示發病前曾接觸(如處理或清洗)生的海產，而過半數(32名病人)記得曾被魚蝦蟹等活海鮮割傷。

預防之道

創傷弧菌既不耐寒也不耐熱。把食物放在雪櫃可減少及/或預防細菌繁殖。烹煮能有效減低因進食受創傷弧菌污染的食物而致病的可能性。海產(尤其是貝類)進食前一定要先徹底煮熟。可以的話，帶殼貝類在烹煮前宜先去殼，好讓熱力較易滲透；或以攝氏100度煮至貝殼張開，然後再多煮三至五分鐘。

很多人嗜吃生的或半熟的貝類，但較易受創傷弧菌嚴重感染的高危人士對生的或未經過徹底煮熟的海產應避之則吉，進食前宜先徹底煮熟。即使專供生吃的海產是來自實施糞便污染控制的水域，也不代表沒有創傷弧菌，因為這種細菌是天然存在於海洋環境的。此外，無論是健康或高危人士，在處理生的海產如魚及貝類時，均應好好保護皮膚(如戴上保護手套)，並避免傷口觸及海水或從海中捕獲的生海產。

注意要點：

1. 長期病患者(尤其是肝病)感染創傷弧菌後可引發致命疾病，故只應進食徹底煮熟的海產。
2. 無論是健康或高危人士都有可能從外露的傷口造成嚴重的創傷弧菌感染。
3. 食物從業員在處理海產時應戴上保護手套和避免傷口外露。

給市民，尤其是高危人士的建議

- 避免進食生或未經過徹底煮熟的海產。
- 處理生的海產時使用保護衣物(如手套)及蓋好傷口。
- 處理生和熟的海產之間要徹底洗淨雙手。
- 如被生的海產所傷，應以肥皂和水盡快清洗傷口。如出現感染症狀(例如皮膚紅腫、疼痛的情況越來越嚴重)，應立即就醫治療。

給業界的建議

- 處理生和熟的海產之間要徹底洗淨雙手。海產須徹底煮熟才待客。
- 用防水膠布或手套蓋好手上的瘡或傷口。

Local Situation

From 2007 to June 2012, there were 106 *V. vulnificus* infection cases reported to the CHP. Among them, 45 cases had the bacterium isolated from blood. Seventy-two cases developed necrotizing fasciitis after the infection. Fifty-nine (82%) of these patients with necrotizing fasciitis had underlying chronic illness or weakened immune system. Around half of the patients with necrotizing fasciitis required amputation. Considering risk factors for developing necrotizing fasciitis after *V. vulnificus* infection, 51 out of 72 patients (71%) reported history of contact with raw seafood, such as handling or cleaning, before onset of symptoms while more than half of these patients (32 patients) recalled cutaneous injury by the seafood such as fish, crab or shrimp during the contact.



在美國，相當數量的創傷弧菌感染與進食墨西哥灣的生蠔有關 (照片由美國National Oceanic and Atmospheric Administration提供)

In the U.S., considerable amount of *V. vulnificus* illnesses are associated with consumption of raw Gulf Coast oysters (Photo by courtesy of National Oceanic and Atmospheric Administration, U.S.A.)

before consumption. Even though seafood specifically intended for raw consumption is harvested from waters with controlled faecal contamination, they are not free from *V. vulnificus* risk as the bacterium is naturally present in marine environments. In addition, both healthy and susceptible subpopulations should protect their skin when handling raw seafood like fish and shellfish, such as by wearing protective gloves, and avoid exposure of open wound to seawater or raw seafood harvested from seawater.

Prevention

V. vulnificus is susceptible to extreme temperatures. Refrigerating food can minimise and/or prevent the growth of the bacterium. Cooking is an effective way to minimise the likelihood of illness arising from the consumption of *V. vulnificus* contaminated food. Always cook seafood, especially shellfish thoroughly before consumption. For shellfish in the shell, remove the shells before cooking if possible as they impede heat penetration or boil them at 100°C until their shells open; boil for additional three to five minutes afterwards.

Even though many people like consuming some shellfish live and raw or after insufficient cooking, susceptible subpopulations who are at greater risk of severe *V. vulnificus* infection should always avoid consuming raw or partially treated seafood and cook seafood thoroughly before consumption. Even though seafood specifically intended for raw consumption is harvested from waters with controlled faecal contamination, they are not free from *V. vulnificus* risk as the bacterium is naturally present in marine environments. In addition, both healthy and susceptible subpopulations should protect their skin when handling raw seafood like fish and shellfish, such as by wearing protective gloves, and avoid exposure of open wound to seawater or raw seafood harvested from seawater.

Key Points to Note:

1. *V. vulnificus* can result in life-threatening illness in individuals with underlying chronic conditions, particularly liver disease, hence they should only consume seafood cooked thoroughly.
2. Both healthy and susceptible individuals may contract serious *V. vulnificus* infection via open wounds.
3. Food handlers should wear protective gloves and avoid exposure of open wound during handling of seafood.

Advice to the Public, Especially the Susceptible Individuals

- Avoid consuming raw or partially treated seafood.
- Wear protective clothing (e.g. gloves) and cover all wounds when handling raw seafood.
- Wash hands thoroughly between handling raw and cooked seafood.
- If injured by raw seafood, wounds should be washed with soap and water as soon as possible and seek medical advice promptly if symptoms and signs of infection occur, e.g. increasing redness, pain and swelling.

Advice to Trade

- Wash hands thoroughly between handling raw and cooked seafood. Cook seafood thoroughly before serving.
- Cover sore or cut on hands by waterproof bandages or gloves.

食物中的霉菌毒素 — 導言

Mycotoxins in Food—An Introduction

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,
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由本期開始，我們將會一連三期介紹食物中的真菌所產生的毒素。這些統稱為霉菌毒素的天然毒素由某些種類的真菌（霉菌）所產生，對人類和動物有毒。本文將對食物中主要的霉菌毒素作概括介紹。

食物中的霉菌毒素

大家身為消費者，應該都見過發霉的花生和蘋果吧？這些發霉的食物很可能已被霉菌產生的毒素所污染。人類因真菌產生的天然毒素而染病非始自今日，早在中世紀已有人類霉菌毒素中毒的記載。但直至60年代英國發生10萬隻幼火雞因吃了含有被霉菌毒素污染的花生飼料而死亡的事件後，才引發科學家對霉菌毒素進行現代化研究。

一九六七年，台灣有26人懷疑食物中毒，其中三名小童死亡。事後發現患者家裡的大米含高量黃曲霉毒素，相信這是造成急性中毒的肇因。近年來，霉菌毒素中毒事件仍時有聽聞，且多發生在亞洲和非洲的發展中國家。二零零四年，肯尼亞的農村地區爆發大型霉菌毒素中毒事故，317人發病，125人死亡。罪魁禍首便是黃曲霉毒素含量極高的玉米。

食物中的霉菌毒素從何而來？

有些科學家認為，毒素是霉菌避免食物被其他霉菌和動物掠奪的防禦屏障，一般於收成前和貯存期間產生。在高溫和濕度高的氣候下，多種農作物如穀類、油籽類、水果等都容易發霉，長出產生毒素的真菌。此外，環境欠佳或蟲患都會令農作物容易受霉菌感染。受感染的穀物因為經過加工，肉眼可能看不出真菌的存在，但其實穀物在生長期已被毒素入侵。

雖然食物中大部分的霉菌毒素都是在穀物及其產品中發現的，但有時動物吃了受污染的飼料後，乳汁、肝臟和腎臟也可能含有這些毒素。

This is the first in a series of three articles on the toxins produced by fungus in food. These naturally occurring toxins, known as mycotoxins, are produced by certain species of fungi (moulds) and are toxic to both human and animals. This article will provide a general background on major mycotoxins in food.

Mycotoxins in the Food We Eat

As consumers, we might have encountered mouldy peanuts and apples in the past. Chances are that those foods might also be contaminated with toxins produced by the moulds. Natural fungal toxins in food have been affecting human for a long time. Human poisoning resulting from mycotoxin contamination has been recorded since the Middle Ages. However, the modern study had only developed in the 1960s, after 100 000 young turkeys were killed in England due to peanut meal contaminated by fungal toxins.

Later in 1967, 26 people in Taiwan were affected by suspected food poisoning and three children died. It was found that the rice from the households that contained high level of aflatoxin had caused the acute poisoning. Sporadic outbreaks of mycotoxins poisoning are still being reported in recent times, especially in developing countries in Asia and Africa. In 2004, there was a major outbreak of mycotoxin poisoning in rural Kenya resulting in 317 cases and 125 deaths. Contaminated maize with high levels of aflatoxin was the culprit.

How Do Mycotoxins End Up in Food?

Some scientists suggest that the toxins, produced as a defence against other moulds and animals on their source of food, can be developed before harvest and during storage. The growth of toxin-producing fungi can happen in large varieties of agricultural products like cereals, oilseeds, fruits etc., that are susceptible to mould infestation under high temperature and humidity. Crops that are under environmental stress or attacked by insects are especially susceptible to such infestation. Fungi may not be visible in affected grain products due to processing, but the toxins may have already diffused into the grains during the growth period.

Although most mycotoxins in food are found in grains and their products, the toxins can sometimes find their way into milk, liver and kidney of animals that have consumed contaminated feed.



使用紫外光燈有助分辨在無花果乾滋生的某類霉菌。（照片由何玉賢醫生提供）
The use of UV light can help identify certain types of mould infestation in dried figs. (Photo by courtesy of Dr. Y.Y. HO)

食物裡的主要霉菌毒素及其毒害作用一覽表

Summary table of major mycotoxins that have been found in some food commodities and their major toxicological effects.

霉菌毒素 Mycotoxin	主要受影響的食物 Major Foods Involved	主要毒害作用 Possible Major Toxicological Effects
黃曲霉毒素 Aflatoxins	花生、玉米、棉籽 Peanuts, maize, cottonseeds 奶類及乳製品 Milk & dairy products	肝臟中毒、致癌 Liver toxic, cancer causing
棒曲霉毒素 Patulin	蘋果 Apple	腸胃充血、大量出血和粘膜潰瘍 Excess blood in stomach and intestine, heavy bleeding, open sore in mucous membrane
赭曲霉毒素A Ochratoxin A	穀類、豆類 Cereals, pulses	腎臟毒性，可能致癌 Kidney toxic, possibly cancer causing
伏馬镰孢毒素（伏馬菌素） Fumonisin	玉米 Maize	可能致癌 Possibly cancer causing
單端孢霉烯 Trichothecenes	穀類、小麥、玉米 Cereals, wheat, maize	抑制蛋白質合成（對細胞產生毒性、抑制免疫力）。腎臟毒性 Suppress protein synthesis: toxic to cells and suppress immune system. Kidney toxic
玉米赤霉烯酮 Zearalenone	玉米 Maize	有可能導致幼童性早熟 Possible premature puberty in young children

含霉菌毒素的食物可在經濟上造成多方面的影響，這些影響包括損失巨額貿易和糧食，農戶損失收入和生計，以及承擔人類和禽畜的醫護治療開支等。據報九個非洲國家每年單是由於穀物、乾果和果仁中的黃曲霉毒素，出口往歐盟的貿易額就損失總值7.5億美元。糧食及農業組織估計全球有25%的糧食農作物被霉菌毒素嚴重污染。

霉菌毒素對人體的影響是多方面的。雖然急性霉菌毒素中毒比較罕見，但有些霉菌毒素長遠可引致癌症。若干毒素對人體有顯著的毒害作用，如影響免疫系統、肝臟或腎臟等。由於霉菌毒素在大自然中廣泛存在，要把它們從食物中完全消除是不可能的。然而，只要小心控制農務作業中的各項程序，例如選擇農作物的品種、收成、貯存和加工的程序等，便可減少食物中的霉菌毒素。

下一期我們會深入探討最常見的霉菌毒素 — 黃曲霉毒素。

The economic impacts of mycotoxins in food include significant losses in terms of trade and food, loss of income and livelihood to farming communities, costs of healthcare and veterinary treatments. It has been reported that US\$750 million each year of export trade of cereals, dried fruit and nuts to the European Union are lost in nine African countries alone due to aflatoxins. The Food and Agriculture Organization has estimated that 25% of the world's food crops are significantly contaminated with mycotoxins.

Mycotoxins can cause a wide range of health effects in humans. Although acute mycotoxin poisoning is rare, some mycotoxins can cause cancers in the long run. Certain toxins have specific effects like affecting the immune system, liver or kidney. Since they are so widespread in nature, the total elimination of mycotoxins from food is impossible. However, careful control of farming practices like selection of crop varieties, harvesting, proper storage of harvests and appropriate processing can help reduce the amount of mycotoxins in food.

In the next issue, we would talk in more details about the most common mycotoxins – aflatoxins.

總膳食研究：除害劑殘餘

食物安全中心上月發表總膳食研究報告，指本港市民從膳食攝入四組共85種常見除害劑（又稱農藥）殘餘的分量屬低水平，且全部低於相關的安全參考值。對於那些關注從食物中攝入除害劑殘餘對身體有害的人士，相信該研究結果可釋除他們的疑慮。

食物事故點滴 Food Incident Highlight

這項研究分析的四組除害劑（有機磷類除害劑、氨基甲酸酯類、除蟲菊素類和擬除蟲菊酯類，以及二硫代氨基甲酸酯類代謝物）全部都是農作物中常用的除害劑。食物中檢出除害劑殘餘並不一定代表不宜食用。在評估除害劑殘餘對健康帶來的風險時，除了考慮除害劑的毒性外，還要考慮攝入的分量及時間長短。研究結果並沒有發現本港市民有從膳食攝入過多除害劑殘餘而引致健康問題的情況。

耕種者如按照優良務農規範正確施用除害劑，只會殘留少量的除害劑於作物上，食用這些蔬果不會影響健康。消費者宜注意均衡飲食，包括進食多種蔬果，因為蔬果是健康飲食重要的一環。

Total Diet Study on Pesticide Residues

Last month, the Centre for Food Safety (CFS) released the *Total Diet Study* results which found dietary exposures of the local population to 85 commonly encountered pesticide residues under four pesticide groups were low and all of them below safety reference values. People who are concerned over health risk resulting from dietary exposure to pesticide residues can be reassured.

Pesticides under the four groups studied (organophosphorus pesticides, carbamates, pyrethrins and pyrethroids, and dithiocarbamate metabolites) are commonly used on agricultural crops. Food items detected with pesticide residues do not automatically mean they are unsafe for consumption. In assessing the health risks of pesticide residues, apart from their toxic nature, the amount and the duration of exposure must also be considered. The study does not show that there is any excessive exposure raising health concerns.

Proper use of pesticides in accordance with good agricultural practice would only leave small amounts of residues in crops. Consumption of these vegetables/fruits will not affect health. Consumers are advised to take a balanced diet including a variety of fruits and vegetables as they are essential components of a healthy diet.

石斑魚乾小食含河豚毒素

二零一二年六月十五日，食物安全中心（中心）發出食物警報，警告市民一款石斑魚乾小食可能混有河豚，因而驗出含河豚毒素，建議市民停止食用有關產品。

河豚毒素中毒主要由進食河豚所引致。河豚毒素毒性強烈，中毒症狀包括面部及手脚麻痺，隨後四肢逐漸癱瘓及呼吸困難，攝入高劑量更可導致死亡。病徵通常在吃下毒素後10至45分鐘出現，但亦可延至三小時。

中心建議市民切勿進食有關食品，並把產品退回商戶。為安全起見，市民亦不宜食用同一品牌其他口味的魚乾。涉事商戶已主動回收相關產品，中心亦已向其發出警告信。如該產品再推出市面出售，中心會抽取樣本作化驗。



出事產品“御家族”「鮮魚撈」鮮海石斑魚乾
The affected product "ACE Family" grilled grouper

Tetrodotoxin in Grilled Grouper Snack

On 15 June 2012, the Centre for Food Safety (CFS) issued a **food alert** warning the public not to consume a kind of grilled grouper snack as the product might have been mixed with pufferfish and found containing tetrodotoxin.

Tetrodotoxin is a potent toxin often associated with the intake of pufferfish. The symptoms of tetrodotoxin intoxication include numbness sensation in the face and extremities, followed by progressive paralysis, and respiratory distress. With high dose exposure, death may occur. The onset of symptoms occurs from 10 to 45 minutes after ingestion, but may be delayed by three hours.

The CFS advised the public not to consume and return the affected products to the company. As a precautionary measure, grilled grouper snacks of other flavours of the same brand should be avoided. The company initiated a product recall and the CFS has issued a warning letter. Follow-up samples will be collected for testing if the same product is found available in the market again.

風險傳達 工作一覽 Summary of Risk Communication Work

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