

本期內容 IN THIS ISSUE

- ❖ 認識產志賀毒素大腸桿菌：重大食物安全問題
- ❖ 對抗即食食品的抗菌素耐藥性
- ❖ 觀賞魚適合進食嗎？
- ❖ 番薯和蔬果中的天然色素
- ❖ 風險傳達工作一覽
- ❖ Understanding STEC: A Significant Food Safety Issue
- ❖ Fight Against Antimicrobial Resistance in Ready-to-eat Food
- ❖ Is Ornamental Fish Meant for Consumption?
- ❖ Natural Colour Pigment in Sweet Potatoes and Produce
- ❖ Summary of Risk Communication Work

編輯委員會 EDITORIAL BOARD

總編輯
楊子橋醫生
顧問醫生(社會醫學)(風險評估及傳達)

行政編輯
張勇仁醫生
首席醫生(風險評估及傳達)

委員
吳志翔醫生 首席醫生(風險管理)
戴慶豐獸醫 高級獸醫師(獸醫公共衛生)
張偉文先生 高級總監(食物安全中心)
朱瑞燕女士 高級總監(食物安全中心)
譚秀球醫生 主管(風險評估組)
陳以信博士 高級化驗師(食物研究化驗所)

Editor-in-chief
Dr. Samuel YEUNG
Consultant (Community Medicine)
(Risk Assessment and Communication)

Executive Editor
Dr. Terence CHEUNG
Principal Medical Officer
(Risk Assessment and Communication)

Members
Dr. Henry NG
Principal Medical Officer (Risk Management)
Dr. Eric TAI
Senior Veterinary Officer (Veterinary Public Health)
Mr. W. M. CHEUNG
Senior Superintendent (Centre for Food Safety)
Ms. S. Y. CHU
Senior Superintendent (Centre for Food Safety)
Dr. Carole TAM
Head (Risk Assessment Section)
Dr. Gabriel CHAN
Senior Chemist (Food Research Laboratory)

認識產志賀毒素大腸桿菌： 重大食物安全問題

Understanding STEC: A Significant Food Safety Issue

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,
Risk Assessment Section, Centre for Food Safety

美國上月回收了與多個州爆發產志賀毒素大腸桿菌感染(確切來說是O121:H1型大腸桿菌引發的感染)有關的某品牌冷藏炸鷹嘴豆餅食品,至於回收的冷藏炸鷹嘴豆餅食品如何受到污染,美國有關當局則沒有報導。食物安全中心並無發現本地曾售賣或進口受影響的食品,但也建議市民若曾在網上購買受影響的食品便應丟棄。世界衛生組織表示,食源性產志賀毒素大腸桿菌感染每年約導致一百萬宗病症。本期將探討此公共衛生問題的最新認知。

Last month, frozen falafel products of a certain brand were recalled in the United States (US) due to the linkage with a multistate outbreak of Shiga toxin-producing *Escherichia coli* (STEC) infections, specifically caused by *E. coli* O121:H19. How the recalled frozen falafel products being contaminated has not been reported by US authorities. While the Centre for Food Safety did not identify local sale or import of the affected products, the public was advised to discard the affected products should they have acquired the products online. According to the World Health Organization, foodborne STEC infections cause about one million illnesses each year. In this issue, we will talk about the latest understanding on this public health issue.

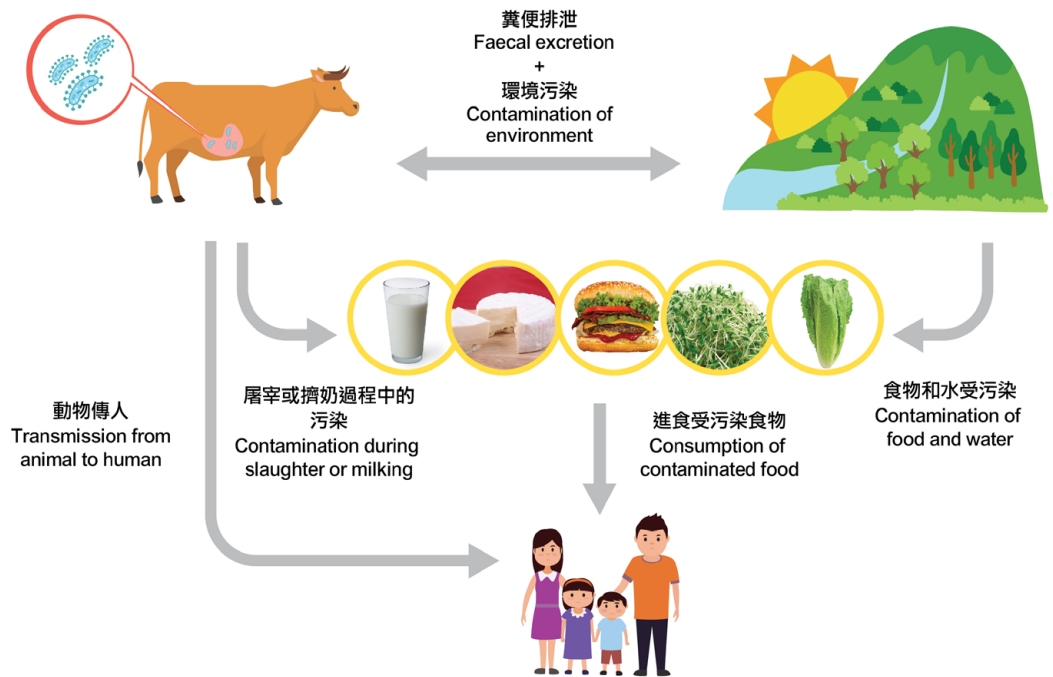


圖1：產志賀毒素大腸桿菌的可能來源及傳播方法
Figure 1: Possible sources and transmission of STEC

部分大腸桿菌菌株可引致疾病

大腸桿菌是動物和人類腸道中常有的菌叢的一部分。大部分菌株都是非致病性的,但部分大腸桿菌可引致人類腸胃不適,當中以產志賀毒素大腸桿菌尤其惹人關注。產志賀毒素大腸桿菌由一組龐大多樣的菌株組成,這些菌株產生志賀毒素。產志賀毒素大腸桿菌菌株大

Some *E. coli* strains are pathogenic

E. coli are part of the common flora found in intestines of animals and humans. Most of them are non-pathogenic, but some *E. coli* strains are able to cause gastrointestinal illness in humans; STEC is of particular concern. STEC comprised a large, highly diverse group of strains which produce the Shiga toxin (Stx). All STEC strains probably have the potential to cause diarrhoea but some can cause severe illnesses. The most well known one is *E. coli* O157:H7 which can cause

多能引致腹瀉，部分更能引致嚴重疾病，當中最為人熟識的是 O157:H7 型大腸桿菌，此型能使人患上出血性結腸炎(出血性腹瀉)和可致命的溶血尿毒症(破壞腎臟血管繼而引致腎衰竭)。除 O157:H7 型大腸桿菌外，包括 O121 在內的其他血清型大腸桿菌也與人類感染個案爆發有關。然而，最新的科學資料顯示，確定某菌株的血清型後也不能準確預測會否引致溶血尿毒症等嚴重後果。

產志賀毒素大腸桿菌通過進食受污染食物等途徑進入人體腸道，繼而依附在腸臟上皮細胞並在腸道內釋放產志賀毒素引致疾病。[最近的評估](#)¹指出，產志賀毒素大腸桿菌菌株是否有分別與依附能力相關和產生特定類型志賀毒素的基因，可用以估計產志賀毒素大腸桿菌菌株的潛在嚴重性，從引致輕微的腹瀉、出血性腹瀉到嚴重的溶血尿毒症。

產志賀毒素大腸桿菌的常見感染來源

漢堡包的肉常與 O157:H7 型大腸桿菌有關，肉類表面的細菌會被帶到碎肉的內部，[當碎肉未經煮熟時](#)便會繼續存活。除牛肉外，產志賀毒素大腸桿菌也曾引起其他食物爆發感染。就爆發數據進行的分析發現，全球最常見的產志賀毒素大腸桿菌感染來源是牛肉，其次是農產品(蔬果)和乳製品¹。為應對產志賀毒素大腸桿菌的威脅，國際機構正在制定用以控制牛肉、生乳及生乳製成的芝士、綠葉蔬菜和芽菜中產志賀毒素大腸桿菌的指引。

冷藏食物或沒有徹底煮熟

消費者應注意，並非所有冷藏食物都已徹底煮熟或可供即食，受細菌污染的配料(如香草)或會存在於冷藏食物中。儘管如此，進食冷藏食物前，足夠的熱處理能減低感染產志賀毒素大腸桿菌的風險。產志賀毒素有別於某些食源性致病細菌(如金黃葡萄球菌)在食物中產生的耐熱毒素，鮮有由產志賀毒素大腸桿菌在食物中產生，除非食物已受到嚴重污染，到了會腐壞的程度。產志賀毒素大腸桿菌若污染了冷藏食物，則在冷藏的環境下仍可存活。儘管某些冷藏食物看似已煮熟，消費者仍應查看食物包裝上的指示，了解食物在進食前是否需要翻熱或烹煮。

注意事項

1. 除了 O157:H7 型大腸桿菌，其他血清型產志賀毒素大腸桿菌也可能引致嚴重疾病，視乎菌株依附在腸壁細胞上的能力和有否產生特定類型的產志賀毒素而定。
2. 全球最常見的產志賀毒素大腸桿菌感染爆發來源是牛肉，其次是農產品和乳製品。
3. 並非所有冷藏食物都已徹底煮熟或可供即食，污染配料的產志賀毒素大腸桿菌在冷藏食物中仍可存活。

給業界的建議

- 向顧客提供食用預先包裝食物所需的特別指示，例如有關烹煮或翻熱的指示。
- 在食品生產的任何階段，食物都可能受到污染。食物業經營者要了解與食品生產有關的危害，並時刻遵從[良好衛生規範](#)。

給市民的建議

- 消費者須查看並遵從食物包裝上的烹煮或翻熱指示。
- 要徹底煮熟冷藏食物以供安全食用，中心部分的溫度須達到攝氏 75 度。

¹ 糧農組織/世衛微生物風險評估聯席會議：產志賀毒素大腸桿菌與食物：歸因、特性與監察。

haemorrhagic colitis (bloody diarrhoea) and life-threatening hemolytic-uraemic syndrome (HUS) (causing damage to blood vessels in kidneys resulting in kidney failure), in humans. Apart from *E. coli* O157:H7, other serotypes, such as O121, have also been associated with outbreaks of human cases. However, latest scientific information suggested that determining the serotype cannot accurately predict whether a strain would induce severe outcomes like HUS.

STEC causes disease by entry into the human gut, such as through consumption of contaminated food, subsequent attachment to the intestinal epithelial cells and release of Stx inside the gut. [Recent review](#)¹ reported that the presence of genes related to the attachment ability and the production of specific Stx inside the gut types respectively in STEC strains can be used to estimate STEC strains' potential severity, from causing mild diarrhoea, bloody diarrhoea to severe HUS.

Common Sources of STEC in Outbreaks

Hamburger meat is known to link to *E. coli* O157:H7 in which bacteria on meat surface are brought to the inner part of minced meat and survive [when the minced meat is undercooked](#). In addition to beef, other food items have been implicated in outbreaks of STEC. Analysis of outbreak data revealed that the most frequently attributed source of STEC globally was beef, followed by produce (fruits and vegetables) and dairy products¹. To address the threats of STEC, development of guidelines by international authorities for the control of STEC in beef, raw milk and cheese produced from raw milk, leafy greens and sprouts is underway.

Frozen Foods May Not Be Fully Cooked

Consumers should beware that not all frozen foods are fully cooked or ready-to-eat, ingredients such as herbs that is contaminated with bacteria could be present in frozen food. That said, the risk of STEC can be reduced by sufficient heat treatment of the frozen food before consumption. Unlike the heat stable toxin produced in food by some foodborne pathogenic bacteria like *staphylococcus aureus*, Stx is seldom produced by STEC in food unless the food is heavily contaminated to a level that would result in spoilage of food. Should there be contamination of frozen foods with STEC, it can survive under frozen condition. While some frozen products may seem cooked, consumers should always check the instructions on product packaging to see if the food is needed to be reheated or cooked before consumption.

Key Points to Note

1. Apart from *E. coli* O157:H7, other STEC serotypes can potentially cause severe illnesses depending on strains ability to attach to gut cells and production of specific types of Stx.
2. The most frequently attributed source of STEC outbreaks globally was beef, followed by produce and dairy products.
3. Not all frozen foods are fully cooked or ready-to-eat and, the STEC that contaminates the ingredients will survive in frozen foods.

Advice to the Trade

- Provide customers with the special instructions that are needed for the use of prepackaged food, for instance, cooking or reheating instructions.
- Food can become contaminated at any stage during food production; food business operators need to understand the hazards associated with the food they produce and [practise good hygiene](#) at all time.

Advice to the Public

- Consumers should always check and follow the cooking or reheating instructions on product packaging.
- To cook frozen products thoroughly for safe consumption, its core temperature should reach 75°C.

¹ Joint FAO/WHO Expert Meetings on Microbiological Risk Assessment: Shiga toxin-producing *Escherichia coli* (STEC) and food: attribution, characterization, and monitoring.

對抗即食食品的抗菌素耐藥性

Fight Against Antimicrobial Resistance in Ready-to-eat Food

食物安全中心風險傳達組
研究主任鄭基慧女士報告

Reported by Ms. Amy CHENG, Research Officer,
Risk Communication Section, Centre for Food Safety

近數十年來，抗菌素耐藥性微生物（又稱「超級細菌」）已對公眾健康構成迫切威脅。在人類及動物身上使用的抗生素濫用，導致這些耐藥性微生物可以通過食物傳播。抗菌素耐藥性令治療感染和預防死亡的工作更趨困難，情況惹人關注。因此，我們需要採取行動提高食物安全，並改善食物、人類與環境之間的協調工作。

即食食品與抗菌素耐藥性

已預先烹製，無須再烹煮便可進食的食物稱為「即食食品」。焗好的麵包、經巴士德消毒的奶類及罐裝食品已經過加熱到某個度殺死細菌，因此不論是否再作加熱處理也可安全進食。

然而，還有部分即食食品是在生或未煮熟的狀態下進食的，例如刺身、沙律菜及未煮熟的肉類等。這些食物本來就屬高風險食物，因為沒有經過熱處理或熱處理不足，未能消滅當中可危害人體健康的微生物。這些生或未煮熟的即食食品也與感染「超級細菌」的風險有連帶關係。「超級細菌」指產生了抗菌素耐藥性的微生物，具有令多種抗菌素（例如抗生素）不再對其有效的能力，導致感染更難以治療。



圖2：有助去除食物中的「超級細菌」的方法
Figure 2: Ways to help address "superbugs" in food

抗菌素耐藥性如何擴散到人類

抗菌素耐藥性可隨時間通過基因轉變自然出現，也可由濫用抗菌素引發，可通過污染食物源頭令人類受感染。沒有正確處理農場的糞便或會造成污染，於是「超級細菌」可經由受排泄物污染的土壤或水源進入食物鏈，以及因使用受污染的水灌溉而傳播至水果及其他農作物。在街市屠宰牲口及牲口的運輸也會構成重大影響，因為當部分食物被當作即食食物進食時，抗菌素耐藥性細菌便可進入食物鏈。

在本港，食物安全中心（食安中心）在2019年至2020年期間進行的香港食物抗菌素耐藥性微生物先導調查結果發現，收集到的即食食物的樣本當中，15.1%檢出「超級細菌」。調查結果應提醒市民注意從即食食品感染「超級細菌」以及其他引致食物中毒的細菌的風險。現時，食安中心正對食物中的抗菌素耐藥性進行監測，涵蓋刺身和沙律等即食食品。

如何對抗即食食品的抗菌素耐藥性

進食前徹底煮熟食物是殺死或存在於食物中的「超級細菌」最有效的方法。然而，消費者應注意進食某些生或未煮熟的即食食物時感染「超級細菌」的潛在風險。高危人士，例如孕婦、嬰幼兒、長者及免疫力較低人士（包括長期病患或正接受抗生素治療、使用抗胃酸藥、長期服用類固醇或抗排斥藥物

In recent decades, antimicrobial resistance (AMR) microorganisms, also called "superbugs", have become a looming threat to public health. These resistant microorganisms can spread through food due to misuse of antibiotics which are used in humans and animals. AMR is of concern as it leads to more difficulties in treating infections and preventing death. As such, it prompts the need for action to improve food safety and coordination of action among food, humans and the environment.

Ready-to-eat foods and AMR

Foods that have been prepared so they can be consumed without any additional cooking are called "ready-to-eat" foods. Baked bread, pasteurised milk and canned products are considered ready-to-eat as they have been heated to certain temperature to kill bacteria and can be consumed safely with or without further heat treatment.

However, there are some other ready-to-eat foods that are eaten in raw or undercooked state, such as sashimi, salad greens and undercooked meat. They are intrinsically high-risk as there is no or inadequate heat treatment to eliminate the microorganisms present that can pose risks to human health. These raw or undercooked ready-to-eat foods are also associated with the risk of contracting "superbugs". Superbugs are microorganisms that have developed AMR to stop a wide range of antimicrobial agents, antibiotics for example, from working against them. Consequently, they make infections harder to treat.

How AMR spreads to humans

AMR may occur naturally over time, usually through genetic changes. It can also be a result of antimicrobial misuse. Humans can contract AMR bacteria via contaminated food source. Contamination can occur at all levels of the food chain, from farm level such as using contaminated water for irrigation for growing fruits and other produce, at slaughterhouse whereas careless evisceration spreads intestinal content of food animal onto the meat, to cross-contamination during food preparation by contaminated utensils, environment, other raw food ingredients or contaminated hands of the food handlers.

In the local context, the Pilot Survey for AMR Microorganisms in Food in Hong Kong conducted by the Centre for Food Safety (CFS) in 2019-20 revealed that 15.1% of the ready-to-eat food samples collected were detected with "superbugs". Such findings should act as a reminder to people on the risk of contracting "superbugs", among other bacteria that cause food poisoning from ready-to-eat food. Currently, the CFS is conducting AMR surveillance in food, including ready-to-eat food like sashimi and salads.

How to tackle AMR in Ready-to-eat Food

Thorough cooking before consumption is the most effective way to kill "superbugs" that may be present in food. Consumers should however be aware of the inherent risk of contracting "superbugs" when they eat certain raw and undercooked ready-to-eat food. Susceptible populations such as pregnant women, infants and young children, the elderly and people with weakened immunity (i.e. people with chronic diseases or those on antibiotics treatment, antacid and long-term steroids or drugs given to prevent transplant rejection, etc) are of higher risk and should therefore avoid eating raw and undercooked ready-to-eat foods.

等人士)的風險較高,故應避免進食生或未煮熟的即食食物。

烹製即食食物時,應保持良好食物衛生習慣,包括:

1. 即食食品 and 生的食物(如肉類和家禽)要徹底分開處理。烹製即食食品時,要使用不同器具。
2. 用流動的清水徹底沖洗農產品能去除污垢和減少農產品上的細菌,然而此舉不一定能去除所有致病微生物和「超級細菌」。
3. 處理食物前後,要徹底洗手。
4. 確保工作面和器具(如砧板和刀具)在使用前後均已清潔和消毒。

When preparing ready-to-eat foods, good food hygiene should be practised which includes:

1. Keep ready-to-eat food completely separated from raw food (e.g. meat and poultry) to avoid contamination. Use separate utensils for preparing ready-to-eat food.
2. Wash produce thoroughly in running water can remove dirt as well as reduce bacteria on them. This however does not guarantee removal of all disease-causing microorganisms and "superbugs".
3. Wash hands thoroughly before and after handling food.
4. Make sure work surfaces and utensils (e.g. chopping boards and knives) are clean and disinfected before and after use.

觀賞魚適合進食嗎?

Is Ornamental Fish Meant for Consumption?

網上有關進食觀賞魚的討論引起了市民對食物安全的關注。食用魚類跟大部分當作寵物飼養的魚類,無論品種跟飼養方式均有所不同。儘管部分魚類品種既可觀賞也可食用,消費者卻不一定懂得如何辨別可供食用的品種。

觀賞魚大多不是飼養來作為食物的。這些魚類或沒有用不含病原體的飼料餵飼,因此可能受到寄生蟲及細菌污染。部分用以治療觀賞魚疾病的藥物不應用於供食用魚類,像某些獸藥(如孔雀石綠)及抗生素殘餘(如氯霉素)會對人體有害,當中部分化學物質耐熱,因此無法通過烹煮清除。另外,部分魚類(如狗臉河豚)含有致命毒素。

觀賞魚並不適合進食。消費者應只向持牌食物業處所購買食用魚類。食物業界必須確保所出售的魚類適宜供人食用,並符合本地法例。

Concerns about food safety were brought up in an online discussion about eating ornamental fish. Fish for food and most fish that people keep as pets are different in species and how they are raised. Though some fish species may be used for both ornamental and consumption purposes, consumers may not be able to distinguish edible species.

Ornamental fish may not have been raised to be food. These fish may not be fed with pathogen-free feed, potentially contaminated with parasites and bacteria. Some medications in treating ornamental fish diseases should not be used in fish for consumption, like certain veterinary drugs (e.g. malachite green) and antibiotic residues (e.g. chloramphenicol) which are harmful to humans. Some of these chemicals are heat stable and can not be removed by cooking. Moreover, some fish, such as dog-faced puffer fish, contain life-threatening toxins.

Ornamental fish is not meant for consumption. Consumers should only buy fish from licensed food premises. Food businesses must ensure the fish they sell is fit for human consumption and that it complies with local laws.

番薯和蔬果中的天然色素

Natural Colour Pigment in Sweet Potatoes and Produce

紫心番薯是本港冬日經常食用的食物,但由於大量顏色會於清洗或在沸水中烹煮的過程中滲到水中或手上,部分市民或會關注番薯是否經人工染色。

紫心番薯含有花青素,一種自然存在於紅菜頭、漿果、紅火龍果、葡萄、紅椰菜、紅洋蔥、茄子皮及黑米等常見蔬果的色素。花青素可溶於水,一般對人體無害。這些蔬果中部分品種顏色艷麗,能吸引消費者,因此獲選取種植。處理這些蔬果時,部分色素滲到水中或擦到手上屬自然現象,市民無須過分擔心。

Purple sweet potato is a popular food item in winter locally. However, some people might be concerned that the sweet potatoes may have been artificially coloured, as significant amount of colour can seep out into the water and hands when washed or boiled.

Purple sweet potatoes are known to contain anthocyanin, a pigment that is naturally found in common produce like beetroot, berries, red dragon fruit, grapes, red cabbages, red onions, eggplant skin and black rice. Anthocyanin is water-soluble and generally harmless to humans. Some of these varieties of produce are selected and bred for their vibrant colours that appeal to consumers. When these produce are handled, it is natural for some pigments to seep into the water or be rubbed onto hands. There is no need for undue concern.



風險傳達工作一覽 (二零二二年十月)

Summary of Risk Communication Work (October 2022)

事故/ 食物安全個案 Incidents/ Food Safety Cases: 195	公眾查詢 Public Enquiries: 62	業界查詢 Trade Enquiries: 190	食物投訴 Food Complaints: 391	給業界的快速警報 Rapid Alerts to Trade: 8
給消費者的食物警報 Food Alerts to Consumers: 0	懷疑食物中毒個案通報 Suspected Food Poisoning Alerts: 2	教育研討會/ 演講/ 講座/ 輔導 Educational Seminars/ Lectures/ Talks/ Counselling: 48	上載到食物安全中心網頁的新訊息 New Messages Put on the CFS Website: 32	