



由食物環境衛生署食物安全中心於每月第三個星期三出版  
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## 焦點個案 Incident in Focus

## 蘿蔓生菜及免治肉類中的 O157:H7型大腸桿菌

## *E. coli* O157:H7 in Romaine Lettuce and Ground Meat Products

食物安全中心風險評估組  
吳雪兒獸醫報告

二零一八年四月,食物安全中心(中心)公布,即時暫停美國亞利桑那州出產的蘿蔓生菜進口及在港出售,因為該地區生產的蘿蔓生菜疑受O157:H7型大腸桿菌污染。本文將提供資料,闡述感染O157:H7型大腸桿菌的原因、症狀及預防措施。

### 美國發生涉及蘿蔓生菜事故的經過為何?

截至二零一八年六月二十八日,美國的疾病控制及預防中心(Centers for Disease Control and Prevention)報稱在36個州份中,共210人受該事故的O157:H7型大腸桿菌病菌株感染,其中96人入院治療,五人死亡。加拿大亦報稱發生八宗有類似的基因指紋的O157型大腸桿菌感染個案。調查顯示,亞利桑那州尤馬縣(Yuma region)的蘿蔓生菜可能受O157:H7型產志賀毒素大腸桿菌污染,並很可能是該事故的感染源頭。爆發是次大腸桿菌感染事故涉及多個場所,並非由單一農場、加工商或分銷商負上全部責任。從尤馬縣水道抽取的水樣本是唯一與是次事故涉及的大腸桿菌病菌株配對一致的樣本。美國當局會繼續進行調查。

### O157:H7型大腸桿菌感染的成因為何?

大腸桿菌是常見於溫血動物的下腸道內的一組細菌。大部分大腸桿菌均屬無害,然而部分大腸桿菌(例如產志賀型大腸桿菌)能引起嚴重的食源性疾病。最為人熟悉及毒性最強烈的產志賀型大腸桿菌是O157:H7型大腸桿菌。有關的細菌可令人類致病,但在動物身上通常不會引起症狀。

O157:H7型大腸桿菌的主要宿主是牛隻,傳播至人類的主要途徑,是通過食用受污染食物(例如生/未煮熟的免治肉類及生奶)。食物及水受糞便污染,以及食物在製備期間出現交叉污染(即與牛肉及其他肉類

Reported by Dr. Cherrie NG, Veterinary Officer,  
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In April 2018, the Centre for Food Safety (CFS) announced that import into and sale in Hong Kong of romaine lettuce produced in the State of Arizona (AZ), the United States (US), had been suspended with immediate effect, as the product might have been contaminated with *Escherichia coli* (*E. coli*) O157:H7. This article provides information on the cause and symptoms of *E. coli* O157:H7 infection and its prevention.

### What Happened in this Incident Involving Romaine Lettuce in the US?

As of 28 June 2018, the US Centers for Disease Control and Prevention reported that 210 people from 36 states were infected with the outbreak strain of *E. coli* O157:H7. Ninety-six people were hospitalised with five deaths. Eight cases of *E. coli* O157 infection with a similar genetic fingerprint were also reported in Canada. Investigations indicated that romaine lettuce from the Yuma region of AZ could have been contaminated with Shiga toxin-producing *E. coli* (STEC) O157:H7 and was the likely source of this outbreak. Multiple establishments were involved and no single farm, processor or distributor was solely responsible for the outbreak.

Water samples taken from a canal in the Yuma region were the only matches to the outbreak strain. Investigation in the US continues.

### What Causes *E. coli* O157:H7 Infection?

*E. coli* refer to a large group of bacteria and are commonly found in the lower intestine of warm-blooded animals. Whilst most *E. coli* are harmless, some, such as STEC, can cause severe foodborne diseases. The most recognised and virulent serotype of STEC is *E. coli* O157:H7. It is pathogenic in humans, but usually asymptomatic in animals.

The main reservoir of *E. coli* O157:H7 is cattle. The transmission to humans is primarily through consuming contaminated foods (e.g. raw/undercooked ground meat products and raw milk). Faecal contamination of food and water, and cross-contamination during food preparation



焦點個案  
Incident in Focus

製品、受污染的物件表面及廚房設備等交叉污染)亦會導致人類受感染。此外,因食用受污染的蔬果導致爆發大腸桿菌感染的事例愈來愈多。蔬果受污染的原因,可能是在食物鏈中曾接觸受污染的糞肥、使用受污染的水灌溉或清洗,以及工作人員衛生欠佳。

### O157:H7型大腸桿菌感染有什麼症狀?

大腸桿菌感染的症狀包括腹痛及腹瀉,甚至帶血性腹瀉。嘔吐及發燒亦可能出現。大部分病人會在十日內痊癒,但小部分人(特別是幼童及長者)可能會出現危及生命的疾病(例如溶血性尿毒綜合症)。溶血性尿毒綜合症的特點是會引致急性腎衰竭、溶血性貧血及血小板減少症。

### 如何預防O157:H7型大腸桿菌感染?

產志賀型大腸桿菌不耐高溫,因此,預防受O157:H7型大腸桿菌感染,和應對其他因食物引起的感染一樣,可採取同樣的預防措施,例如“徹底煮熟食物”。肉類表面可能會透過屠宰動物或之後的處理過程受O157:H7型大腸桿菌污染。當肉類被絞碎再製成免治肉類(例如漢堡扒),這些原本沾在肉類表面的細菌便會被帶進肉類的內部。因此,特別是免治肉類應徹底煮熟,直至內外均變成啡色及流出的肉汁清澈。水果及蔬菜(特別是供生吃的)應用流動的清水徹底沖洗。在處理食物前及如廁後,人們應用水及肥皂徹底清潔雙手。

### 中心採取的行動

鑑於美國亞利桑那州出產的蘿蔓生菜可能受O157:H7型大腸桿菌污染,除上述暫停有關產品進口外,中心呼籲業界如持有受影響產品,應立即停止使用或停售。此外,中心亦加強從進口及零售層面抽檢來自美國的蘿蔓生菜。

#### 注意事項:

1. 雖然人類感染O157:H7型大腸桿菌的主要源頭是食用受污染的未經煮熟的免治肉類及生奶,但食用受污染蔬果引致感染的事例也愈來愈多。
2. O157:H7型大腸桿菌感染的症狀包括腹痛及腹瀉,但小部分病人可能會出現危及生命的溶血性尿毒綜合症。
3. 防止受O157:H7型大腸桿菌感染所採取的措施,與應對其他食源性疾病所建議的預防措施相若(例如“徹底煮熟食物”)。

### 給業界的建議

- 應遵循《優良製造規範》處理供生吃的蔬果,以助控制相關的微生物危害。
- 在提供食用前,免治肉類應徹底煮熟,其中心溫度最少達到攝氏75度。

### 給市民的建議

- 免治肉類應徹底煮熟,直至內外均變成啡色及流出的肉汁清澈。
- 水果及蔬菜(特別是供生吃的)應用流動的清水徹底洗淨。

(with beef and other meat products, contaminated surfaces and kitchen utensils) also lead to infection. Further, an increasing number of outbreaks are associated with consuming contaminated fruits and vegetables. Such contamination can be from contact with contaminated manure, contaminated water used for irrigations or washing and worker hygiene throughout the food chain.

### What Are the Symptoms of *E. coli* O157:H7 Infection?

The symptoms include abdominal cramps and diarrhoea that may in some cases progress to bloody diarrhoea. Vomiting and fever may also occur. Most patients recover within ten days but a small proportion (particularly young children and the elderly), may lead to life-threatening diseases such as haemolytic uraemic syndrome (HUS). HUS is characterised by acute renal failure, haemolytic anaemia and low blood platelets.

### How to Prevent *E. coli* O157:H7 Infection?

STEC is heat-sensitive, thus, preventative measures for other foodborne infections, such as "cook thoroughly" are also recommended to *E. coli* O157:H7. Meat may be contaminated with *E. coli* O157:H7 on the surface from the slaughter process or subsequent handling. When meat is minced then made into ground meat products (e.g. hamburgers), these surface bacteria will be brought into the inner part of the meat. Therefore, ground meat products, in particular, should be thoroughly cooked until brown throughout and the juices run clear. Fruits and vegetables, especially if to be eaten raw, should be washed thoroughly under clean running water. One should wash hands thoroughly with water and soap, particularly before handling food and after using the toilet.

### Actions Taken by CFS

In view that romaine lettuce produced in AZ in the US might have been contaminated with *E. coli* O157:H7, in addition to the import suspension mentioned earlier, the CFS has urged the trade to stop using and selling the product concerned immediately should they possess it. Besides, the CFS also has enhanced surveillance of romaine lettuce produced in the US at import and retail levels.

#### Key Points to Note:

1. Although the primary sources of human *E. coli* O157:H7 infections are contaminated undercooked ground meat and raw milk, outbreaks associated with fruits and vegetables are increasing.
2. The symptoms of *E. coli* O157:H7 infection include abdominal cramps and diarrhoea but a small proportion of patients can develop life-threatening HUS.
3. Preventative measures for *E. coli* O157:H7 infections are similar to those recommended for other foodborne diseases (e.g. "cook thoroughly").

### Advice to the Trade

- For fruits and vegetables to be consumed raw, follow Good Manufacturing Practice to help control relevant microbial hazards.
- Ground meat products should be thoroughly cooked to reach a centre temperature of at least 75°C before being served.

### Advice to the Public

- Ground meat products should be thoroughly cooked until brown throughout and the juices run clear.
- Fruits and vegetables, especially if eaten raw, should be washed thoroughly under clean running water.

# 抗菌素耐藥性——同樣也是食物安全問題

## Antimicrobial Resistance – Also a Food Safety Issue

食物安全中心 風險評估組  
蕭雲濤獸醫報告

Reported by Dr. Stephenie SIU, Veterinarian,  
Risk Management Section, Centre for Food Safety

一九二八年，英國醫生及科學家亞歷山大弗萊明爵士(Sir Alexander Fleming)首次發現抗生素盤尼西林。在二十世紀，盤尼西林被譽為靈丹妙藥，因為有助治療當時的多種不治之症，例如腦膜炎及肺炎。然而，自發現該偉大藥物後不足一個世紀，抗菌素耐藥性已成為全球公共衛生構成重大影響的問題。二零一五年，第六十八屆世界衛生大會針對抗菌素耐藥性問題推出一項全球行動計劃，以“健康一體”的方式下對抗這個新出現的健康威脅。為應對本地的抗菌素耐藥性問題，政府在二零一七年推出《香港抗菌素耐藥性策略及行動計劃(2017-2022)》，促請跨界別加強合作。

In 1928, penicillin, the first antibiotic, was discovered by the British physician-scientist Sir Alexander Fleming. It was hailed as the miracle drug of the 20th century as it helped cure diseases, which were regarded deadly back to the days, such as meningitis and pneumonia. However, less than a century since the great discovery, antimicrobial resistance (AMR) has become a major global public health concern. In 2015, the 68th World Health Assembly has launched a global action plan on AMR to combat this emerging health threat in the approach of One Health. To tackle AMR locally, the Government has launched the Hong Kong Strategy and Action plan on Antimicrobial Resistance (2017-2022) in 2017 and calls for multi-sectoral collaboration.

### 什麼是抗菌素耐藥性？

根據世界衛生組織，抗菌素耐藥性是指某種微生物(例如細菌、病毒及部分寄生蟲)具有令抗菌劑(例如抗生素、抗病毒藥物及抗真菌藥物)不再對其有效的能力。結果，標準治療無效，病人受感染的情況持續，更可能傳染他人。不過，抗菌素耐藥性屬自然現象。微生物會通過基因突變或微生物之間的基因轉移而自動產生耐藥性。

### What Is AMR?

According to the World Health Organization, AMR is the ability of a microorganism (like bacteria, viruses and some parasites) to stop an antimicrobial agent (such as antibiotics, antivirals and antifungals) from working against it. As a result, standard treatments become ineffective, infections persist and may spread to others. Nevertheless, AMR is a natural phenomenon. Microorganisms gain resistance spontaneously by gene mutation or gene transfer among each other.

### 抗菌素耐藥性是如何傳播？

抗菌素耐藥性問題日趨嚴重，因素甚多。其中一個主要成因，是人類及動物錯用及濫用抗微生物藥物(見圖)，而令微生物加快出現抗菌素耐藥性。當病人或食用動物接受抗生素後，易感細菌會被殺死，但具耐藥性基因的細菌則存活。因此，抗藥性細菌的數量或會超過易感細菌，並在人體或食用動物的腸道繁殖。當體內帶有抗藥性細菌的病人前往醫院、診所或社區，這些抗藥性細菌會通過不潔的設施或人與人的直接接觸而傳染他人。

### How Does AMR Spread?

Many factors lead to the rise of AMR. One of the major contributions is misuse and overuse of antimicrobial drugs in both humans and animals (see fig), which accelerates the emergence of AMR in microorganisms. When antibiotics are given to sick people or food-producing animals, susceptible bacteria are killed and bacteria with resistant genes survive. Therefore, AMR bacteria may outgrow their counterpart and develop in our bodies or gut of food-producing animals. When patients, carrying the resistant bacteria, go to hospitals, clinics or communities, these AMR bacteria spread to others through poor hygiene and unclean facilities or direct contact.



抗藥性細菌經人傳播(途徑A)及經食用動物傳播(途徑B)。  
The spread of AMR bacteria through humans (Path A) and food-producing animals (Path B).

抗菌素耐藥性同樣也對食物安全構成影響。在動物腸道繁殖的抗藥性細菌可經食物鏈傳播。當食用動物被屠宰時，有關的肉及肉類製品可能會被有抗藥性細菌的排泄物所污染。抗藥性細菌亦能經由受排泄物污染的土壤或水進入食物鏈，以及因使用受污染的水灌溉而傳播至蔬果及其他農作物。人類可通過以下方式接觸到抗藥性細菌：進食未經徹底煮熟的受污染食物；製備食物的方式不衛生；或直接接觸到動物糞肥。

### 有何措施可抑制食物鏈中的抗菌素耐藥性？

為有效減低在食物鏈中出現抗菌素耐藥性和抑制抗菌素耐藥性傳播，各有關界別的人士(包括獸醫專業、農業、環境及食物業界)均需通力合作。採取預防措施，至為重要。舉例來說，農民應在禽畜身上善用抗菌劑，不應把抗生素用作生長促進劑。獸醫應協助食用動物養殖場採用良好畜牧規範，以減低對抗生素的需求。食物製造商應採取有效的衛生措施，以便在食物加工期間，保持食物衛生，盡量減少交叉污染。

下期文章將會提供更多資料，探討如何防止人們受食物中已存在的抗藥性細菌所感染。

AMR is also a food safety concern. AMR bacteria developed in animal gut can spread through the food chain. When the food-producing animals are slaughtered, meat and their products can be contaminated by the excreta colonised with AMR bacteria. AMR bacteria can also enter the food chain through fecal contamination of soil or water, and spread to fruits, vegetable or other produce that are irrigated with contaminated water. People may be exposed to AMR bacteria when they consume contaminated food without being thorough cooked, prepare food with poor food hygiene practice, or contact with animal manure.

### What Are the Measures to Contain AMR in Food Chain?

To effectively minimise the emergence and contain the spread of AMR in food chain, coordinated effort from people in all sectors, including veterinary profession, agriculture, environment and food industry is needed. Preventive measures are of the utmost importance. For example, farmers should optimise use of antimicrobials in livestock. Antibiotics should not be used as growth promoters. Veterinarians should assist food animal production farm to adopt good husbandry practices to reduce the need of antimicrobials. Food producers should take effective sanitation measures to maintain food hygiene and minimise the cross contamination during food processing.

Our next article will provide more information on how to prevent ourselves from infection with AMR bacteria already present in food.

### 食物事故點滴

#### Food Incident Highlight

## 水果有益，但受立百病毒污染的話可奪命！ Fruits Are Healthy, But Contamination With Nipah Virus Can Be Deadly!

最近，世界衛生組織(世衛)報告，印度喀拉拉邦州爆發立百病毒感染導致多人死亡。立百病毒感染是一種新發的人畜共患病(即由動物傳至人類的疾病)，個案死亡率甚高，在世衛東南亞區域對公共衛生構成重大影響。人類受立百病毒感染，可引致無症狀性感染，甚或急性呼吸系統疾病及致命腦炎等多種嚴重疾病。

果蝠是立百病毒的自然宿主。立百病毒的可能傳播途徑包括：進食曾被蝙蝠咬食的水果；直接接觸受感染動物或其受污染的體液或組織；或人類之間傳播。若前往受立百病毒影響的地方(例如印度)，應注重個人衛生(例如經常用洗手液及清水洗手)。此外，避免飲用椰棗原汁或棕櫚酒。如飲用新鮮採摘椰棗的汁液，應先煮沸；食用水果前應徹底洗淨並去皮。水果一旦有蝙蝠咬痕便應丟掉。

Recently, the World Health Organization (WHO) reported a number of deaths due to Nipah virus (NiV) infection in Kerala State, India. NiV infection is an emerging zoonotic disease (i.e. transmitted from animals to humans) of public health importance in the WHO South-East Asia Region with a high case fatality rate. In infected people, it causes a range of illnesses from asymptomatic (subclinical) infection to acute respiratory illness and fatal encephalitis.

Fruit bats are the natural host for NiV virus. Possible routes of NiV transmission include consumption of fruits partially eaten by the bats, direct contact with infected animals or their contaminated body fluids or tissues, and human-to-human transmission. When travelling to places affected by NiV (e.g. India), consumers are advised to observe good personal hygiene (e.g. wash hands frequently with liquid soap and water). Moreover, avoid drinking raw date palm sap or toddy (i.e. palm wine). Boil freshly collected date palm juice. Wash fruits thoroughly (and peel, if practical) before consumption. Discard fruits with sign of bat bites.

## 有毒鰕虎魚誤當彈塗魚 小心致命河豚毒素 Beware the Fatal Tetrodotoxin of Mudskipper-like Toxic Gobies

最近，有傳媒報道，有人未經許可進入米埔沼澤區捕捉彈塗魚。這樣的行為不但會構成環境問題，還可能引起有關食物安全的關注。

彈塗魚(例如大彈塗魚)屬鰕虎魚科(鰕虎魚)，與同屬一科的雲斑裸頰鰕虎魚外形相似。雲斑裸頰鰕虎魚是少數含有致命毒素——河豚毒素的鰕虎魚。河豚毒素亦存在於部分河豚內。

河豚毒素可影響人類的中樞神經系統；情況嚴重者，更可導致死亡。這種毒素不能通過烹煮清除，亦無解毒劑。中國內地據報曾發生有人進食有毒鰕虎魚導致食物中毒，甚至死亡的個案。對於把有毒鰕虎魚誤當為彈塗魚吃掉的風險，市民應有所警惕。

Recently, media reported that some people had entered Mai Po Marshes without authorisation to catch mudskippers. This practice may pose not only environmental issues but also potential food safety concerns.

Mudskippers, for example *Boleophthalmus pectinirostris*, are a member of the Gobiidae family (gobies). They look similar to another member of Gobiidae family, *Yongeichthys criniger*, which is one of the few gobies that contain a fatal toxin called tetrodotoxin. Tetrodotoxin also occurs in some puffer fish.

Tetrodotoxin can affect a person's central nervous system, and in extreme cases, death can occur. The toxin cannot be destroyed by cooking and has no antidote. Food poisoning and even death cases from eating toxic gobies have been reported in Mainland China. The public should be aware of the risk of eating toxic gobies mistaken for mudskippers.



## 風險傳達工作一覽 (二零一八年六月) Summary of Risk Communication Work (June 2018)

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