

食物安全焦點

Food Safety Focus



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Centre for Food Safety

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食物安全中心
風險評估組
研究主任方朗茵博士報告
Reported by Dr. Fiona FONG, Research Officer,
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Centre for Food Safety

自二零一六年五月首次回收後，美國至今已回收了數款疑受產志賀毒素大腸桿菌污染的麵粉產品，當地有些人疑於進食或處理生麵團後感到不適。美國疾病控制及預防中心報告指，截至二零一六年七月二十五日，共有46人感染產志賀毒素大腸桿菌(45人受O121型感染，1人受O26型感染)。美國疾病控制及預防中心和美國食物及藥物管理局現正進行調查。

部分受影響批次的產品曾進口香港。在得悉美國生產商回收受影響產品的事件後，食物安全中心(中心)已立即指令業界停止售賣受影響的產品，並展開回收。本文將探討產志賀毒素大腸桿菌的風險及中心對事件的跟進行動。



兒童在舔曲奇生麵團
A kid licking raw cookie dough

Since the initial recall on 31 May 2016, several varieties of flour products have been recalled in the US due to possible contamination with Shiga toxin-producing *Escherichia coli* (STEC). Some people, who had eaten or handled raw dough, got sick. The US Centers for Disease Control and Prevention (USCDC) has reported that as of 25 July 2016, 46 people were infected with the outbreak strains of STEC O121 (45 people) or O26 (1 person). The US CDC and the US Food and Drug Administration (USFDA) are still investigating the outbreak.

Certain batches of the affected products had been imported into Hong Kong. Upon noting of the occurrence the incident in the US, the Centre for Food Safety (CFS) has immediately instructed the trade to stop selling the affected products and initiate recalls. This article discusses the risk of STEC and the follow-up actions taken by the CFS regarding the incident.

什麼是產志賀毒素大腸桿菌？

大腸桿菌通常寄生於人類和動物的腸道。大多數大腸桿菌都是無害，而且有助保持人類腸道健康。不過，有些大腸桿菌的菌株會透過產生志賀毒素而致病。這些細菌被稱為產志賀毒素大腸桿菌(又稱產Vero毒素大腸桿菌或腸道出血性大腸桿菌)。產志賀毒素大腸桿菌可引致嚴重腹瀉，是世界各地爆發食源性疾病的元凶之一。

產志賀毒素大腸桿菌的血清型主要依據O抗原和H抗原。O157:H7型大腸桿菌是最常見的血清型，而其他血清型大腸桿菌(包括O121和O26)則統稱為“非O157型產志賀毒素大腸桿菌”。產志賀毒素大腸桿菌可在7°C至50°C的環境中生長，而最佳溫度為37°C。部分產志賀毒素大腸桿菌亦可在酸鹼度低至4.4的酸性食物中生長。只要把食物徹底煮熟至中心部份的溫度達到70°C或以上便可消滅該菌。

What is STEC?

E. coli normally live in the intestines of people and animals. Most *E. coli* are harmless and actually are an important part of healthy human intestinal tract, but some strains of *E. coli* can cause diseases through the production of a toxin called Shiga toxin. These bacteria are called STEC but may also be called Verocytotoxin-producing *E. coli* (VTEC) or enterohaemorrhagic *E. coli* (EHEC). STEC is an important group of *E. coli* that can cause severe diarrhoea and has been implicated in many foodborne outbreaks worldwide.

The serotyping of STEC is based on their O antigen and H antigen. *E. coli* O157:H7 is the most common serotype while others *E. coli* serogroups, including O121 and O26, are called “non-O157 STECs”. STEC can grow in temperatures ranging from 7°C to 50°C, with an optimum temperature of 37°C. Some can grow in acidic foods, down to a pH of 4.4. It can be destroyed by thorough cooking until the core temperature of the food reaches 70°C or above.

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焦點個案

Incident in Focus

產志賀毒素大腸桿菌的潛伏期約為兩至十天，一般為三至四天。受影響的人可能會出現腹痛、水狀腹瀉，甚至帶血腹瀉。有些患者可能會發燒和嘔吐。約2至15%的病人可能會出現溶血尿毒症。此症是一種嚴重併發症，症狀是紅血球出現不正常的分解死亡，腎臟受到損害以及血小板偏低。溶血尿毒症在五歲以下的幼童較為常見。在二零一二至一五年期間，衛生署衛生防護中心共錄得12宗確診受產志賀毒素大腸桿菌感染的個案。

感染源頭

反芻動物，特別是牛隻，是產志賀毒素大腸桿菌的自然宿主。腸道寄生了產志賀毒素大腸桿菌的反芻動物表面可全無症狀，但會間歇性排出帶有該菌的糞便。根據美國食物及藥物管理局的資料，麵粉的原材料是從田地直接採收的穀物，一般沒有經過殺菌處理。如動物曾在田地排糞或排尿，該處的穀物很可能受污染，而這些受污染的穀物最後可能被採收並磨成麵粉。因此，公眾要注意食用及處理麵粉和生麵團的風險。

產志賀毒素大腸桿菌可透過進食受污染的食物、飲用受污染的水，或直接接觸帶有該菌的動物而傳播。該菌亦可在人與人之間直接傳播。市民應加倍留意未經煮熟和生的免治肉類、未經巴士德消毒法處理的奶類，以及未經煮熟的蔬菜和芽菜等食物。進食受污染的食物容易染病，因為只需小量的產志賀毒素大腸桿菌即可令高風險人士患病。

中心採取的行動

部分受影響批次的產品曾進口香港，包括預先包裝麵粉和預先包裝蛋糕粉。中心得悉美國生產商回收受影響產品的事件後，隨即呼籲市民停止食用有關產品，還與美國當局聯絡，並指令業界停售受影響的產品及展開回收。中心暫時沒有接獲因食用受影響產品而食物中毒的個案。中心會保持警覺，密切留意事態發展，以及採取適當的跟進行動，以保障食物安全和公眾健康。

注意要點：

1. 產志賀毒素大腸桿菌是經由口糞途徑傳播，而進食受污染的食物、飲用受污染的水，或直接接觸帶有該菌的動物是常見的感染途徑。
2. 大腸桿菌不能在高溫下生存，徹底煮熟食物可消滅大腸桿菌。
3. 市民應保持良好的個人衛生，並於進食前徹底烹煮或焗用生麵團和麵粉漿製成的食品。

給業界和消費者的建議

- 在處理生麵團前後應把雙手、工作平面及其他用具徹底洗淨。
- 配製食物的地方應慎防交叉污染。

給消費者的建議

- 切勿進食或品嚐生麵團及麵粉漿。

給業界的建議

- 確保麵粉及其製品適宜供人食用。
- 為謹慎起見，切勿向顧客提供生麵團，或容許兒童及其他顧客接觸生麵團。

The incubation period for STEC infection is two to 10 days, usually three to four days. Symptoms of STEC infection include abdominal pain and watery diarrhoea that may in some cases progress to bloody diarrhoea. Fever and vomiting may also occur. A serious complication, haemolytic uraemic syndrome (HUS), occurs in two to 15% of STEC infection cases. HUS, a condition characterised by abnormal destruction of red blood cells, kidney damage and low platelet count, is more common in children under five years of age. According to the Centre for Health Protection of the Department of Health, 12 cases of STEC infection were recorded from 2012 to 2015.

Sources of Infection

Ruminants, especially cattle, are the natural reservoir for STEC. STEC may reside asymptotically in the intestines of ruminants and may be shed intermittently in faeces. According to USFDA, flour is derived from grains that come from fields directly and is not treated to kill bacteria in general. If animals defecate or urinate in the field, their waste may contaminate the grains, which are subsequently harvested and milled into flour. People should therefore be aware of the risks associated with the consumption and handling of flour and raw dough.

STEC transmission occurs through consumption of contaminated food and water, or direct contact with STEC carrying animals. Person-to-person transmission of STEC is also possible. Raw or undercooked ground meat products, unpasteurised milk and contaminated raw vegetables and sprouts are of particular concern. Consumption of contaminated food may pose a high risk of illness as a low dose of STEC can cause illness in susceptible populations.

Actions Taken by the CFS

Certain batches of the affected products, including prepackaged flour and cake mix, had been imported into Hong Kong. Upon learning the incident occurred in the US, the CFS has immediately advised the public not to consume the affected products, liaised with the US authorities and alerted the trade to stop selling the affected products and initiated recalls. No local food poisoning cases related to the consumption of the affected products have been reported. The CFS will remain vigilant, continue to monitor the situation and take appropriate follow-up actions in a bid to safeguard food safety and public health.

Key Points to Notes:

1. STEC infection is transmitted by faecal-oral route through contaminated food and water, or direct contact with STEC carrying animals.
2. *E. coli* cannot survive under high temperature and can be killed by thorough cooking.
3. People should maintain good personal hygiene and bake items made with raw flour dough or batter before eating them.

Advice to the Trade and Consumers

- Wash hands, work surfaces, and utensils thoroughly before and after handling raw flour dough.
- Be aware of the potential of cross-contamination in food preparation areas.

Advice to Consumers

- Do not eat or taste raw flour dough or batter.

Advice to the Trade

- Ensure that the flour and flour products are fit for human consumption.
- As a precaution, do not serve raw dough to customers or allow children and other guests to handle raw dough.

營養素度量法及其應用

Nutrient Profiling and its Application

食物安全中心
風險評估組
科學主任何國偉先生報告

Reported by Mr. Nicky HO, Scientific Officer,
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世界各國愈來愈注重減輕心血管疾病和高血壓等非傳染病帶來的疾病負擔。世界衛生組織(世衛)的重點工作之一就是降低不健康飲食模式帶來的風險，以減少非傳染病引致的死亡。海外機構已開始把營養素度量法應用於規範和規管不健康的食物。本文將探討營養素度量法及其應用情況。

營養素度量法

營養素度量法是以預防疾病和促進健康為目的，根據食品的營養成分組合對其進行分類或排序的科學，是一種評價食物營養價值的科學方法。

營養素度量模型主要分為兩大類：一類是根據結果描述食品的營養素含量(例如高糖、高鈉)；另一類是根據結果描述食品對人體健康的影響(例如健康、健康之選)。

營養素度量模型的構建

世衛一直與國際上的專家和機構合作，為構建或改良營養素度量模型提供指導。世衛在二零一零年技術會議的報告中就構建營養素度量模型的前期策劃工作提供了詳細的指導。

There is a growing interest around the world to reduce the disease burden of non-communicable diseases (NCD) such as cardiovascular diseases and hypertension. Reducing the risk from unhealthy diet is one of the key focus areas of the World Health Organization (WHO) to prevent deaths from NCD. Overseas authorities have started to develop nutrient profiling for the development of norms and regulations for unhealthy foods. This article talks about nutrient profiling and its applications.

Nutrient Profiling

Nutrient profiling is the science of classifying or ranking foods according to their nutritional compositions for reasons related to preventing disease and promoting health. It is a scientific method for assessing the nutritional quality of foods.

There are two main groups of nutrient profile model. One generates descriptions referring to the nutrient levels in foods (e.g. high sugars, high sodium) while the other generates descriptions referring to the effects of consuming the foods on a person's health (e.g. healthy, healthy option).

Development of Nutrient Profile Model

The WHO has been working with international experts and partners to provide guidance in developing or adapting nutrient profile models. In the report of a technical meeting held in 2010, it provided a step-by-step process for planning the development of a nutrient profile model.



(a) 交通燈標籤計劃(資料來源：英國衛生署)，(b) 健康星級評級系統(資料來源：澳洲聯邦)，(c) 鎖眼標籤制度(資料來源：瑞典國家食品署)

(a) Traffic light labelling system (Source: UK Department of Health), (b) Health Star Rating system (Source: Commonwealth of Australia), (c) Keyhole labelling scheme (Source: National Food Agency, Sweden)

營養素度量法涉及的營養素和食物成分

營養素度量法以哪些營養素作為度量指標，通常視乎科學證據所顯示各種營養素攝入量對公眾健康的影響而定。因此，令慢性疾病風險增加的營養素(例如鈉、糖、飽和脂肪和反式脂肪等)通常會被納入。另一方面，為了對食物的營養價值作出更全面的評估，對健康有益的營養素(例如蛋白質和膳食纖維等)有時也會包括在內。

除了營養素外，各地因應當地的膳食指引和建議，可能會選取一些食物成分如食物配料(例如水果、堅果和豆類等)和食物添加劑(例如甜味劑等)等作為度量指標。

營養素度量法一般是通過對食品的營養素含量或/及食物成分評分或/及閾值來對食品進行分類或排序。

營養素度量法的應用

營養素度量法用途廣泛，最常見的是配合食物標籤制度使用，以幫助消費者對食物的營養成分組合有更清晰的了解，從而選購更健康的食物。此外，營養素度量法也可應用於實施向兒童推銷食品各種建議。

海外國家已相繼針對各種用途建立不同的營養素度量模型。

在英國，交通燈標籤計劃按食品的脂肪、飽和脂肪、糖和鹽的含量水平分別以紅色、黃色及綠色標示。另外，脂肪、鹽和糖含量超標的食品被禁止在以16歲以下兒童為對象的電視節目中播放廣告。

Nutrients and Food Components Involved in Nutrient Profiling

The nutrients involved in nutrient profiling generally depend on the evidence relating nutrient intakes to public health outcomes. So, nutrients that are associated with increasing risk for chronic diseases, such as sodium, sugar, saturated fat and trans fat are always involved. Moreover, nutrients that are good for our health, such as protein and dietary fibre may sometimes be taken into account in order to provide a more complete picture on the nutritional quality of foods.

Other than nutrients, food components like ingredients (such as fruits, nuts and legumes) and food additives (such as sweetener) may also be involved in nutrient profiling based on the dietary guidelines and recommendations in the regions or countries.

Nutrition profiling usually classifies or ranks foods by means of scoring or/and thresholds based on the contents of nutrients or/and food components.

Application of Nutrient Profiling

Nutrient profiling can be used for various applications. It is commonly used in food labelling schemes aimed at helping consumers better understand the nutrient composition of foods and identify foods that are healthier options. It can also be used in implementing the recommendations on the marketing of foods to children.

Overseas countries have started to develop various nutrient profile models for different applications.

In the United Kingdom, the traffic light labelling system ranks fat, saturated fat, sugar and salt of a food product by assigning the colour green, amber and red according to the content levels. In addition, food products that exceed specified levels of fat, salt and sugar cannot be advertised in television programmes commissioned for audiences below the age of 16.

在澳洲，健康星級評級系統按食品的營養素含量(即能量、飽和脂肪、糖和鈉，有時也會包括蛋白質、鈣質和膳食纖維)和配料資料(即水果、蔬菜、堅果和豆類)來為食品評級，級別用星星數目來顯示，從半顆星至五顆星不等。星星數目越多，表示食物越健康。

北歐部分國家採用的鎖眼標籤制度，以膳食纖維、鹽、糖、脂肪和飽和脂肪含量為標準，標示同一產品類別中的健康之選。

在香港，一般預先包裝食物的營養標籤和營養聲稱受營養資料標籤制度規管。為了幫助消費者作出有依據的食物選擇，食物標籤上須載有能量及七種指定營養素的資料，而低脂、高鈣等各類營養聲稱亦受到規管。

改善飲食習慣與促進市民健康

營養素度量法雖然未必能夠顧及營養、膳食和健康的所有範疇，但對於配合改善膳食模式的各種介入措施非常有用。營養素度量模型是根據食物的營養成分組合對其進行分類，而這些資料正可以成為膳食建議的依據。因此，營養素度量模型必須補足及配合當地的膳食指引。

In Australia, the Health Star Rating system rates food products from ½ a star to 5 stars, based on their nutrient contents (i.e. energy, saturated fat, sugar, and sodium, and in some instances, protein, calcium and dietary fibre) and ingredient information (i.e. fruits, vegetables, nuts and legumes). The more stars, the healthier the choice.

In some Nordic countries, the Keyhole labelling scheme identifies healthy foods within a product group, based on the criteria relating to dietary fibre, salt, sugar, fat, and saturated fat.

In Hong Kong, the Nutrition Labelling Scheme covers nutrition labelling and nutrition claims on general prepackaged foods. It requires information on energy and seven specified nutrients to be listed on food labels and regulates nutrition claims (such as low fat, high calcium), so as to assist consumers in making informed food choices.

Improve Diet and Promote Public Health

Although nutrient profiling does not address all aspects of nutrition, diet and health, it is a helpful tool to use in conjunction with interventions aimed at improving diets. Nutrient profile models classify foods based on their nutrient composition and the information can be used to help in achieving dietary recommendation. So, nutrient profile models need to complement and support food-based dietary guidelines in the regions or countries in which they are applied.



朱古力中的礦物油

食物事故點滴
Food Incident Highlight

近日有德國消費者組織指一些受歡迎的朱古力產品含礦物油，事件引起公眾關注。礦物油的主要成分是飽和碳氫化合物(MOSH)和可能致癌的芳香族碳氫化合物(MOAH)。

礦物油在我們周遭隨處可見。食物中的礦物油通常來自循環再造紙、紙板、包裝上的印刷油墨、加工處理助劑和潤滑劑等。脂肪含量高或表面面積大的食物當接觸到含礦物油的物料時，較易受到污染。德國聯邦風險評估所曾於二零一二年評估朱古力含礦物油對健康的影響，結論是從朱古力攝入芳香族碳氫化合物的含量佔本底含量(從整體膳食攝入芳香族碳氫化合物的分量)很少部分，但業界應利用科技盡可能防止食物受包裝上的礦物油污染。

Mineral Oils in Chocolates

Recently, the finding of mineral oils in some popular chocolate products by a German consumer group has caused public concern. Mineral oil mixtures consist of saturated hydrocarbons (MOSH) and potentially cancer-causing aromatic hydrocarbons (MOAH).

Mineral oils are widely found in the environment. Sources of mineral oils in food are recycled papers, cardboards and printing inks used in packaging, processing aids, lubricants, etc. Foods that have high-fat contents or large surface areas are prone to contamination when come into contact with materials containing mineral oils. In fact, the Federal Institute for Risk Assessment (BfR) of Germany evaluated health risks caused by mineral oils from chocolates in 2012. The BfR considered that the contribution of MOAH from chocolates to the background levels (i.e. exposure from overall diet) was low but the contamination with mineral oils from food packaging should be minimised by technological means as far as possible.

海產中的微塑膠

近日有媒體報道，海洋正受到不能分解的微塑膠污染。有環保團體對此表示關注，指這些微塑膠可能已通過魚類和其他海產進入食物鏈，對食物安全構成威脅。

微塑膠是細小的塑膠微粒，來源是多方面的，包括由較大型塑膠垃圾分解而成的碎片和化妝品中的微膠珠等。據歐洲食物安全局的資料，這些微塑膠的大小由0.1微米(與某些細菌相若)至5毫米(一粒黃豆大小)不等。

歐洲食物安全局留意到魚類和其他海產(如青口)體內可能存在微塑膠。該局認為魚類食用部分的微塑膠含量微不足道；而且由於微塑膠主要殘留在魚類的腸胃道，相對於食用整條魚，把內臟清除能減少攝入量。此外，該局認為食用一份重約225克的青口只會攝入少量附於微塑膠上的添加劑或污染物。

為減少攝入微塑膠，食物安全中心建議市民在烹煮前把魚類和海產徹底清洗乾淨，特別是要把可去除的內臟除掉。

Microplastics in Seafood

Recently, the media reported that non-degradable microplastics are polluting the oceans. An environmental group has shown concerns that these microplastics may enter the food chain via fish and other seafood, thus posing a threat to food safety.

Microplastics are small plastic particles originate from various sources, e.g. fragmentation of larger plastic debris, microbeads in cosmetic formulation. According to the European Food Safety Authority (EFSA), their size ranges from 0.1 to 5 000 micrometres (i.e. from about the size of some bacteria to the size of a soybean respectively).

The EFSA has noted that microplastics may be present in fish and seafood (e.g. mussels). For fish, the EFSA opines that the quantity of microplastics in the edible portion of fish is likely to be negligible for consumer exposure. As most of the microplastics will be found in the gastrointestinal tract, gutting will decrease the exposure compared to eating whole fish. Also, the EFSA considered that consuming one portion of mussels (about 225g) would have a small effect on the exposure of additives or contaminants in the microplastics.

To reduce exposure to microplastics, the Centre for Food Safety advises the public to clean fish and seafood thoroughly, especially to remove its digestive tract, where possible, before cooking.

風險傳達 工作一覽 Summary of Risk Communication Work

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