



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

## 由未經巴士德消毒的奶類製成的芝士含有產志賀毒素大腸桿菌

### Shiga Toxin-producing *Escherichia coli* in Cheeses made from Unpasteurised Milk

食物安全中心風險傳達組  
科學主任葉景新先生報告

Reported by Mr. Kenneth YIP, Scientific Officer,  
Risk Communication Section, Centre for Food Safety

二零二零年十一月，食物安全中心(食安中心)接獲歐洲食物安全當局的通知，一批來自意大利由未經巴士德消毒的奶類製成的芳提娜芝士懷疑受產志賀毒素大腸桿菌污染，正進行回收。食安中心隨即發出食物警報，指示進口商展開回收。本文將探討產志賀毒素大腸桿菌如何威脅健康和進入芝士中，並會提供食用芝士及芝士製品的食物安全建議。

In November 2020, the Centre for Food Safety (CFS) received notification from a food authority in Europe that a batch of Fontina cheese made from unpasteurised milk from Italy was being recalled due to possible contamination with Shiga toxin-producing *Escherichia coli* (STEC). The CFS then issued a food alert and prompted the importer to initiate a recall. This article explores how STEC threatens our health and how it gets into cheeses, and provides food safety advice on consuming cheeses and cheese products.

## 產志賀毒素大腸桿菌對健康的影響

大腸桿菌是存在於健康人士腸道內的一大組細菌。大多數大腸桿菌菌株是無害的，但產志賀毒素大腸桿菌卻是致病菌株，可引致嚴重的食源性疾病。產志賀毒素大腸桿菌只需小量即可造成感染，並可在攝氏7度至50度的環境溫度下存活。有些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。產志賀毒素大腸桿菌所釋放的志賀毒素會觸發結腸細胞死亡和破壞血管，導致出血性腹瀉。此外，志賀毒素可進入血液，引致溶血尿毒症及腎衰竭等嚴重疾病。溶血尿毒症是幼兒出現急性腎衰竭的最常見成因。

世界衛生組織表示，產志賀毒素大腸桿菌感染是重大的全球公共衛生問題，而芝士等乳製品是產志賀毒素大腸桿菌感染的食物來源之一。

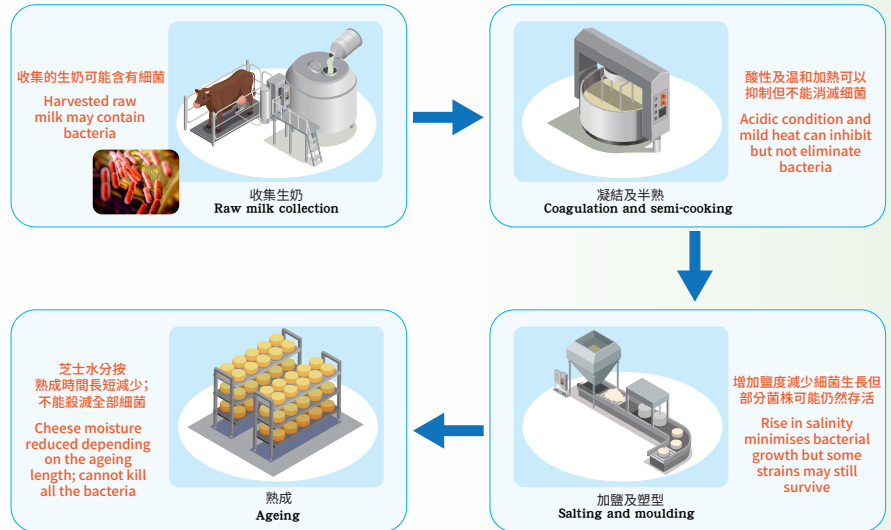


圖1：一般的芝士製作步驟  
Figure 1: General cheese making steps

## Health Concerns with STEC

*E. coli* are a large group of bacteria that can be found in the gut of healthy people. While most *E. coli* strains are harmless, STEC is a pathogenic strain that can cause severe foodborne illnesses. STEC has a low infectious dose and can survive at an ambient temperature from 7°C to 50°C. Some STEC can grow in acidic foods down to pH 4.4. STEC releases Shiga toxin which triggers cell death in the colon and causes damages to blood vessels, resulting in bloody diarrhoea. Besides, Shiga toxin can enter the bloodstream and cause severe illnesses such as haemolytic uraemic syndrome (HUS) and kidney failure. HUS is the most common cause of acute renal failure in young children.

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焦點個案  
Incident in Focus

## 產志賀毒素大腸桿菌如何進入由未經巴士德消毒的奶類製成的芝士中

芝士通常由奶類製成。牛、羊等反芻動物是產志賀毒素大腸桿菌的自然宿主。剛收集的奶類會先經過巴士德消毒等方式進行熱處理以殺滅病原體，才用來製作芝士。不過，某些種類的芝士是由未經巴士德消毒/生的奶類製成，以賦予芝士令部分消費者偏愛的獨特味道與香味。由未經巴士德消毒的奶類製成的芝士屬高風險的生冷食物，因為病原體可能會存在於所用的生奶中。

此外，由未經巴士德消毒的奶類製成的新鮮及軟芝士所帶來的風險較硬芝士為高。硬芝士一般經過多月時間熟成，過程中大量減少芝士所含的水分，使之質感乾燥，細菌生長因而受到抑制。反之，軟芝士的熟成時間較短，甚至沒有經過任何熟成程序，有利病原體生長。

### 芝士的食用安全貼士

由於生產時沒有進行消毒程序，食用芝士，尤其是由未經巴士德消毒的奶類製成的軟芝士，存有微生物風險。因此，孕婦、嬰幼兒、長者及免疫力弱人士等高危人士應避免食用由未經巴士德消毒的奶類製成的芝士。

#### 注意事項

1. 產志賀毒素大腸桿菌感染是重要的全球公共衛生問題，可引致嚴重疾病。
2. 牛、羊等反芻動物是產志賀毒素大腸桿菌的自然宿主，故來自這些動物的奶類如未經巴士德消毒，可能含有產志賀毒素大腸桿菌。
3. 由未經巴士德消毒的奶類製成的芝士屬高風險食物，而軟芝士的風險較硬芝士為高，因為軟芝士未有減少所含水分來降低病原體含量。

### 給市民的建議

- 食用生乳製成的芝士存有風險，須加以注意。
- 購買前查看芝士的標籤及種類(例如風險較高的軟芝士、生乳芝士、霉菌催熟的芝士)。
- 高危人士應避免食用由未經巴士德消毒的奶類製成的芝士。

### 給業界的建議

- 了解生乳製成的芝士屬高風險食物。向可靠的供應商採購芝士及芝士製品，並妥為備存記錄，以便迅速追查來源。
- 向顧客提供芝士的資料，例如是否採用經巴士德消毒的奶類或生乳生產，以便消費者作出知情選擇。
- 在餐牌上列出菜式中的高風險食物配料，例如由未經巴士德消毒的奶類製成的芝士，並在適當情況下向消費者作出食用忠告。

According to the World Health Organization, STEC infection is a substantial public health issue worldwide and dairy products like cheeses are one of the food sources for STEC infection.

### How STEC Gets into Cheeses Made From Unpasteurised Milk?

Cheeses are generally produced from milk. STEC can be found in ruminants including cattle and goats which are natural reservoirs for the bacterium. Harvested milk may be subject to heat treatments such as pasteurisation, which eliminates pathogens, before being used for making cheese. However, certain kinds of cheeses are made from unpasteurised/raw milk to give the preferred flavours and aromas by some consumers. Cheeses made from unpasteurised milk are deemed as [high-risk foods](#) because pathogens may be present in the raw milk used.

In addition, fresh and soft cheeses made from unpasteurised milk are riskier than hard cheeses. Hard cheeses are usually subject to an ageing process in terms of months. Ageing depletes the cheese moisture content to produce a dry texture which can inhibit bacterial growth. Soft cheeses, on the other hand, have a shorter or even have not undergone any ageing process, which favours the growth of pathogens.

### Tips for Consuming Cheeses Safely

The lack of sterilisation process during production implicates an inherent microbiological risk in consuming cheeses, particularly soft cheeses that are made from unpasteurised milk. Therefore, susceptible populations like pregnant women, infants and young children, the elderly and people with weakened immunity should refrain from consuming cheeses made from unpasteurised milk.

#### Key Points to Note

1. STEC infection is an important public health issue worldwide and it can cause severe illnesses.
2. Ruminants such as cattle and goats are natural reservoirs for STEC and unpasteurised milk from these animals may contain STEC.
3. Cheeses made from unpasteurised milk are high-risk foods, and soft cheeses are riskier than hard cheeses as the water content of soft cheeses is not lowered to reduce pathogen load.

### Advice to the Public

- Be aware of the inherent risk in consumption of cheeses made from raw milk.
- Check the label and the type of cheeses (e.g. higher-risk cheeses like soft cheese, raw milk cheese, mould-ripen cheese) before purchase.
- Susceptible populations should avoid consuming [cheeses made with unpasteurised milk](#).

### Advice to the Trade

- Understand that cheeses made from raw milk are high-risk foods. Purchase cheeses and cheese products from reliable suppliers and keep proper records for efficient source-tracing.
- Provide customers with the information of the cheese, such as whether pasteurised milk or raw milk is used in the production, in order to make informed choices.
- List the high-risk food ingredients, cheeses made from unpasteurised milk for example, of dishes on menus and provide [consumer advisory](#) wherever appropriate.

## 氣炸只是比油炸壞處較少嗎？

### Is Air Frying a 'Lesser Evil' Version of Deep Frying?

食物安全中心風險傳達組  
科學主任游天頌先生報告

Reported by Mr. Arthur YAU, Scientific Officer,  
Risk Communication Section, Centre for Food Safety

空氣炸鍋自十年前面世以來，近年已成為本港越來越受歡迎的廚房電器，從隨手便可以找到空氣炸鍋食譜，可見一斑。空氣炸鍋體積小巧，用途廣泛，可烹製多種菜式，因此吸引許多本地家庭使用。空氣炸鍋亦標榜用油量比油炸少得多，烹煮速度較對流式焗爐為快，非常適合小家庭的生活方式及環境。在本文中，我們會討論氣炸的原理、在食物安全方面的優點與缺點，以及使用空氣炸鍋烹製食物時的注意事項。

#### 空氣炸鍋如何運作？

空氣炸鍋雖然名為炸鍋，但其實並非炸鍋，而是小型的枱面對流式焗爐。與對流式焗爐一樣，空氣炸鍋以發熱元件加熱食物，並由內置風扇帶動空氣循環。在空氣炸鍋中，食物更接近熱源，吹着食物的是溫度可高達攝氏200度左右的高速熱風。食物會置於網籃內烹煮，以便熱空氣圍繞食物循環流動。循環的氣流可把食物表面烘得香脆，但中心不會變乾。這種烹煮過程只需少量或不用油，便可模擬油炸的效果。由於食物是在狹小的密閉空間內以流動空氣來炸熟，因此把食物切成小塊，不要重疊，空氣炸鍋便會發揮最佳作用。

#### 氣炸是更健康的烹煮方式嗎？

要回答這個問題，我們需要從整體上考慮食物安全及營養的不同範疇。

##### 脂肪量減少

由於傳熱媒介是熱空氣而非熱油，因此烹製氣炸食物時通常只需加入少量油，便可使炸好的食物口感更佳。此外，任何從肉中流出含有脂肪的肉汁都會分開收集在網籃之下。

雖然可以大幅減少食物的總脂肪含量，但氣炸屬**高溫乾熱烹煮**，與烘焙一樣，容易在高溫烹煮過程中形成化學污染物，例如丙烯酰胺及多環芳族碳氫化合物。市民應小心選擇食物，保持均衡飲食，多吃蔬果，並控制膳食中脂肪及鹽的總量。

##### 烹煮過程中形成丙烯酰胺

在高溫烹煮過程中產生污染物之一的**丙烯酰胺**可能令人患癌。當含豐富碳水化合物的食物在空氣炸鍋中以攝氏120度或以上烹煮時，存在於食物中的游離氨基酸天門冬酰胺與還原糖(例如葡萄糖及果糖)發生反應，便可形成丙烯酰胺。由於是可能令人致癌物，並且有基因毒性，丙烯酰胺沒有安全食用量，故最好減少至可合理做到的盡可能低水平。

氣炸所產生的丙烯酰胺是否較油炸為少，暫時尚未有定論：雖然有不少研究發現，氣炸馬鈴薯的丙烯酰胺含量低於近似的油炸馬鈴



圖2: 空氣炸鍋的基本原理-發熱元件旁設有風扇, 帶動熱空氣迅速循環。食物接近熱源, 滴下的油收集在網籃下方。

Figure 2: The basic principles of air fryers - Rapid circulation of hot air by a fan next to a heating element. Food is kept close to the heat source and oil drips are collected beneath the perforated basket.

In recent years, the air fryer has been an increasingly popular kitchen appliance in Hong Kong since its introduction a decade ago, with air fryer recipes sweeping around the corner. It appeals to many local households due to its compact size and versatility to prepare a wide variety of dishes. The appliance is also touted to use much less oil compared with deep frying, and cook more quickly than the convection oven. This fits in well with the lifestyle and settings of small families. In this article, we will discuss what air frying is, its pros and cons in terms of food safety, and the precautions when preparing food with an air fryer.

#### How Does an Air Fryer Work?

Albeit its name, an air fryer is actually not a deep fryer, but rather a small, countertop convection oven. Like a convection oven, the food is heated by a heating element with air circulation aided by a built-in fan. For air fryers, the food sits closer to the heat source, being blown by hot air up to about 200°C at high speed. Food is cooked inside a perforated basket which facilitates heated air to circulate around the food. The circulating air current can brown the food surface, making it crispy without drying out the centre. This cooking process mimics the result of deep frying with only little or no oil applied. Since food is cooked by moving air in a small, confined area, the fryers will work best when the food is prepared in smaller bits without overlapping.

#### Is Air Frying a Healthier Way to Cook?

To answer this question, we need to consider different areas of food safety and nutrition as a whole.

##### Reduced Amount of Fat

As hot air is the medium of heat transfer instead of hot oil, oil is often added only sparingly during preparation of air-fried food to improve the resulting texture. Also, any fat-containing meat juice drained from the meat is collected separately beneath the perforated basket.

While being possible to reduce significant amount of total fat content in food, air frying involves **high-temperature dry-heat cooking**, similar to baking, which facilitates the formation of chemical contaminants formed during high temperature cook such as acrylamide and polycyclic aromatic hydrocarbons. People should also be careful with what they choose to eat, and maintain a balanced diet which includes plenty of fruits and vegetables with the total amount of fat and salt in check.

##### Formation of Acrylamide During Cooking

One of the chemical contaminants formed due to high temperature cooking, **acrylamide**, can probably cause cancers in humans. It can be formed in an air fryer when carbohydrate-rich food is cooked at 120°C or above in the presence of the free amino acid asparagine and reducing sugars like glucose and fructose. As a probable human carcinogen and is also genotoxic, acrylamide has no safe level for consumption and it is best to reduce the level as low as reasonably possible.

The evidence on air frying in reducing the amount of acrylamide produced when compared with deep frying remains inconclusive: although a number of studies found that air fried potatoes contain less acrylamide than comparable deep-fried ones, a few also reported no significant differences in the level of acrylamide formed in both cooking methods. Other factors, including the composition of

薯，但也有少數研究顯示，兩種烹煮方法所形成的丙烯酰胺分量並無顯著差異。其他因素，包括所使用的馬鈴薯或澱粉的成分、食物的表面積，以及烹煮時間與溫度，亦會增加丙烯酰胺形成的複雜性。一般而言，氣炸時較安全的準則是「**甘銨金黃色**」— 在烹製馬鈴薯、芋頭及麵包等澱粉類食物時，把食物煮至呈金黃色或淺黃色即可，切勿烹煮過度。

### 徹底煮熟食物，並切勿使空氣炸鍋超出負荷

食物應確保徹底煮熟，尤其是較大件的食物；分批烹煮，以免空氣炸鍋超出負荷。注意食物是否有較易烤焦的部分，避免形成有害化學污染物。偶爾翻動一下食物，使食物均勻受熱，防止烤焦。總而言之，食物應煮至全熟，但不要過焦。

potatoes or starches used, surface area of food, and cooking time and temperature, also add to the complexity regarding the formation of acrylamide. As a rule of thumb, it is safer to 'go for gold' when air frying – aim for a golden yellow colour or lighter when preparing starchy foods like potato, taro and bread and do not overcook them.

### Cook Thoroughly and Don't Overload Your Air Fryer

One should ensure that the food is cooked thoroughly, especially for bigger chunks of food; cook in batches to prevent overloading the air fryer. Pay attention to some parts of food that are more prone to getting burnt, forming hazardous chemical contaminants as a result. Turn the food occasionally to promote even cooking and to prevent burn. In a nutshell, always cook well done, but don't char your food.

#### 食物事故點滴

Food Incident Highlight

## 給冷藏食品處理人員預防2019冠狀病毒病的健康建議

### Health Advice for Frozen Food Handlers on the Prevention of COVID-19

近日有傳媒報道，在冷藏食品包裝上檢出存活的2019冠狀病毒病病毒，引起了關注。食物安全中心(食安中心)建議冷藏食品處理人員採取措施，以減低感染2019冠狀病毒病的風險。

冷藏食品處理人員應保持良好的個人衛生習慣，例如尤其在觸摸口、鼻或眼之前、處理食物前後、處理購物後或完成清潔工作後，必須以梘液洗手20秒。值班時，應在適當時使用口罩、護目裝備、手套及工作袍等個人防護裝備。工作環境應通風良好，並採用1:99的稀釋家用漂白水來加強清潔及定期消毒。食物業經營者亦應確保食品處理人員保持適當社交距離，並讓患病的人員盡早求醫。

詳情請參閱[食安中心網頁](#)。

Recently, some concerns have been raised after the media reported that live coronavirus that causes COVID-19 infections had been detected from the packaging of frozen food. The Centre for Food Safety (CFS) has advised frozen food handlers to adopt certain measures in order to minimise the risk of COVID-19 infections.

Frozen food handlers should practise good personal hygiene. For example, wash hands frequently with liquid soap for 20 seconds as appropriate, including before touching mouth, nose or eyes, before and after handling food, after handling dirty objects or after clean-up. Personal protection equipment like face masks, eye protection, gloves and gowns should be used where appropriate while on duty. The working environment should be adequately ventilated, while cleansing and regular disinfection should be stepped up by using 1:99 dilution of domestic bleach. Food business operators should also ensure adequate social distancing among workers and facilitate them to seek medical attention promptly when getting sick.

Please refer to the [CFS website](#) for further details.

## 逐步減少麵包中的鹽

### Reduction of Salt in Bread – Smooth and Steady

《[人口健康調查](#)》指出，本港成年人每日的鹽攝取量為8.8克，遠高於世界衛生組織(世衛)就降低高血壓、中風及心臟病的風險所建議的每日少於5克鹽。為配合世衛的全球目標及[本地非傳染病防控策略的目標](#)，即是在二零二五年或之前人均鹽攝取量減少30%，食物安全中心(食安中心)，在二零一九年九月就預先包裝白方包及麥方包訂立了[自願減鈉目標](#)，以期透過改良食品配方減低麵包的鈉含量。

參與減鹽計劃的七間大型連鎖麵包店及零售商已分階段改良食品配方，減少了預先包裝方包的鹽含量，所有預先包裝方包都已符合減鈉上限目標。有了這些經驗，食安中心在二零二零年十二月進一步邀請本地小型麵包店參與減鹽計劃，目標是減少預先包裝方包中的鹽。中心為成員提供培訓和測試，並協助他們建立標準操作程序。

The [Population Health Survey](#) revealed that the daily intake level of salt in Hong Kong adults is 8.8g. This is much higher than the World Health Organization (WHO)'s recommendation of less than 5g of salt per day for reducing risks of high blood pressure, stroke and heart diseases. In line with the WHO's global target and the local strategy to [prevent and control NCD with a target of 30% reduction in mean population intake of salt by 2025](#), the Centre for Food Safety set up [voluntary sodium reduction targets](#) for prepackaged white and wholemeal bread under the Salt Reduction Scheme in September 2019 to reduce their sodium content through reformulation.

Seven major bakery chains and retailers joined the Scheme, and they have already reformulated and reduced the salt levels in their prepackaged loaves in stages. All of these prepackaged loaves have already met the maximum sodium reduction targets. With the experience in hand, the Scheme is to further recruit smaller local bakeries in December 2020, aiming to reduce the salt in their non-prepackaged loaves. CFS has provided members assistance in training and testing and has helped them to establish Standard Operating Procedures.



## 風險傳達工作一覽 (二零二零年十一月)

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