# 食物安全焦點
# Food Safety Focus

食物安全中心
Centre for Food Safety

食物環境衞生署
Food and Environmental Hygiene Department

二零二四年三月•第二百一十二期
March 2024•212th Issue
ISSN 2224-6908


## 本期內容 IN THIS ISSUE





# 二零二三年有關食肆及食物業的食物中毒個案回顧

# Review of Food Poisoning Outbreaks Related to Food Premises and Food Business in 2023


*食物安全中心風險管理組*
*呂凱文醫生報告*

*Reported by Dr. LUI Hoi Man, Medical & Health Officer, Risk Management Section, Centre for Food Safety*


本文旨在回顧食物環境衞生署（食環署）食物安全中心（食安中心）在二零二三年所接報與本地食肆及食物業有關的食物中毒個案。

## 與本地食肆及食物業有關的食物中毒個案

食物中毒是本港法定須呈報的疾病。為保障市民健康，食安中心聯同衞生署負責調查和監控有關本地食肆及食物業的食物中毒個案。

二零二三年，食安中心接獲219宗由衞生署轉介的食物中毒個案，共有838人受影響（見圖1）。

This article reviews the food poisoning outbreaks (FPOs) related to local food premises and food business reported to the Centre for Food Safety (CFS) of the Food and Environmental Hygiene Department (FEHD) in 2023.

## Food Poisoning Outbreaks Related to Local Food Premises and Food Business

Food poisoning is a statutory notifiable disease in Hong Kong. To protect public health, the CFS, in collaboration with the Department of Health (DH), is responsible for the investigation and control of FPOs related to local food premises and food business.

In 2023, the CFS received 219 food poisoning cases referred by the DH, affecting 838 individuals in total (see Figure 1).

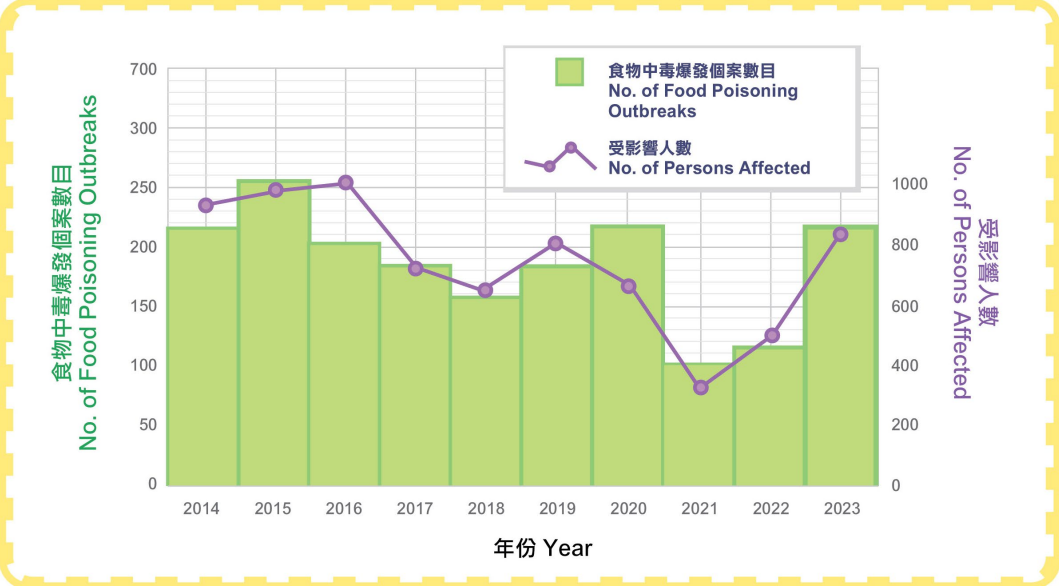


*圖1: 二零一四年至二零二三年有關食肆及食物業的食物中毒爆發個案數目及受影響人數*
*Figure 1: Number of food poisoning outbreaks related to food premises and food business and the corresponding number of persons affected from 2014 to 2023*

## 病原體及成因

在二零二三年所有食物中毒個案中，由細菌性致病菌引起的仍然佔大多數（佔總數的72.2%）。在所有細菌所引起的個案中，首三位的細菌是副溶血性弧菌（31.4%）、沙門氏菌（30.7%）及產氣莢膜梭狀芽孢桿菌（11.2%）。至於病毒所引起的食物中毒個案佔總數25.7%，全部均涉及諾如病毒。其餘的2.7%食物中毒個案則由毒素引起。整體來說，二零二三年食物中毒個案最常見的三大成因分別是「食用生的食物」（22.8%）、「被生的食物污染」（18.1%），以及「貯存溫度不當」（16.5%）。

## 二零二三年發生的大規模流行病學關連食物中毒個案摘要

市民大眾喜歡進食甜品。蛋類是多種甜品，包括芝士蛋糕、梳乎厘、意大利芝士蛋糕及慕司的配料之一，但蛋類有機會含有沙門氏菌 - 是一種進食後能引致食物中毒的細菌。

部分廚師為了保持軟滑的口感，可能沒有把含蛋的甜品徹底煮熟。若使用未經巴士德消毒的蛋來製作甜品，其受沙門氏菌污染的風險將會較使用經巴士德消毒的蛋為高。

事實上，在二零二三年下半年便有8宗關於使用未經巴士德消毒的蛋製作甜品的食物中毒個案。食安中心進行的調查發現，部分業界在製作甜品時使用了未經巴士德消毒的蛋。部分業界也被發現把甜品貯存在不適當的溫度。

為安全製作甜品，食物業可參照以下指引制定標準操作程序：https://www.cfs.gov.hk/tc_chi/whatsnew/whatsnew_fst/files/safe_preparation_of_eggs_and_egg_products_c.pdf

## 涉及諾如病毒及生蠔的食物中毒個案

二零二三年，由諾如病毒引致的食物中毒個案有75宗，全部均與進食雙貝類水產有關，當中大部分個案（70%）在冬季發生。事實上，已有文獻顯示，生蠔驗出諾如病毒的情況存在一種與季節相關的模式。食安中心進行的調查發現，多宗個案涉及進食多於一種生蠔。在數宗食物中毒個案中，欠缺衞生證明書都是被發現的其中一項問題。

## 所採取的行動

食安中心致力提升本港食物安全水平，在是次事故中迅速採取行動並暫停進口有關生蠔。食安中心一直以來均採取多項行動，以確保進口商和供應商貯存和處理生蠔的方法均合符標準。

食安中心又與國際衞生當局交換有關生蠔內發現諾如病毒事故的情報。食安中心會調查每一宗個案，並查核有關食物是否有在本港分銷。在個案中，食安中心已相應地暫停受污染蠔隻的進口。

## 結語

總的來說，食物中毒個案數目在過去十年一直維持在每年大約100至250宗左右。食安中心一直向市民及食物業推廣「食物安全五要點」，以加強業界及市民對風險的認識。業界應安全處理食物，不要把生蠔重新浸入水中存養。高危人士，包括長者、嬰幼兒、孕婦及免疫力較弱人士應避免進食生蠔。

## Causative Agents and Contributing Factors

In all the food poisoning cases in 2023, bacterial foodborne agents remained the major causes (72.2% of all cases). The top three bacteria among all bacterial cases were *Vibrio parahaemolyticus* (31.4%), *Salmonella* (30.7%) and *Clostridium perfringens* (11.2%). Viral cases accounted for 25.7% of FPOs and all were related to norovirus. The remaining 2.7% of FPOs were related to toxins. Overall, "consumption of raw food" (22.8%), "contamination by raw food" (18.1%) and "improper food storage temperature" (16.5%) were the three most frequently found contributing factors.

## Highlights on major Epi-linked Food Poisoning Outbreaks in 2023

Dessert consumption is popular among the general public. Eggs are a component of many desserts, including cheesecakes, soufflé, tiramisu and mousse. But eggs may contain *Salmonella*, a type of bacteria that, if ingested, can cause food poisoning.

Some chefs might not cook the desserts that include eggs thoroughly, in order to maintain a soft and creamy texture. If unpasteurised eggs are used to make desserts, there will be a higher risk of Salmonella contamination as compared with using pasteurised eggs.

In fact, in the second half of 2023, there were 8 food poisoning cases involving the use of unpasteurised eggs in making desserts. Investigations conducted by the CFS found that some food businesses used unpasteurised eggs when making desserts. Some were also found to keep desserts at inappropriate temperatures.

In order to produce desserts safely, food businesses can develop standard operating procedures (SOPs) in accordance with the following guidelines:https://www.cfs.gov.hk/english/whatsnew/whatsnew_fst/files/safe_preparation_of_eggs_and_egg_products.pdf

## Food Poisoning Outbreaks involving Norovirus and Raw Oysters

In 2023, there were 75 cases of FPOs caused by norovirus and they were all associated with the consumption of bivalves. Most of these cases (70%) happened in winter. Indeed, it has been shown in literature that there is a seasonal pattern to the norovirus detection in raw oysters. Investigations conducted by the CFS found that many of these cases involved consuming more than one type of raw oysters. The absence of valid health certificates was one of the issues found in several FPOs.

## Actions taken

The CFS strives to enhance food safety in Hong Kong. The CFS took prompt action and suspended the import of relevant raw oysters. The CFS has been conducting operations to make sure the storage and handling of raw oysters at importer and vendor levels are up-to-standard.

The CFS also exchanges intelligence with international health authorities on incidents related to norovirus in raw oysters. The CFS investigates each case, and checks whether the food has been distributed locally. The CFS suspended the import of contaminated oysters accordingly.

## Conclusion

Overall, the number of food poisoning outbreaks fluctuated from around 100 to 250 cases per year for the past decade. The CFS has all along been promoting the "Five Keys to Food Safety" to the public and food businesses, in order to enhance recognition of risks by the trade and the public. The trade should handle food safely. Do not reimmerse raw oysters into water. Susceptible populations including the elderly, infants and young children, pregnant women and individuals with weakened immunity should avoid consuming raw oysters.

# 產氣莢膜梭狀芽孢桿菌 — 對食物安全的威脅

# *Clostridium perfringens* – A Threat to Food Safety

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*

近日，有一宗懷疑食物中毒事故涉及多間庇護工場和一所食物製造廠製作的膳食有關。涉事的食物懷疑是有肉汁的豬肉，涉及的病原體很可能是產氣莢膜梭狀芽孢桿菌。產氣莢膜梭狀芽孢桿菌是食源性疾病常見的成因。本文將討論產氣莢膜梭狀芽孢桿菌引致食物中毒的風險因素，以及減低食物安全風險的控制措施。

## 產氣莢膜梭狀芽孢桿菌如何引致食物中毒？

產氣莢膜梭狀芽孢桿菌是一種可產生孢子的細菌，廣泛存在於土壤和水等環境中。與產氣莢膜梭狀芽孢桿菌相關的涉事食物為高澱粉質和高蛋白質食物如肉汁、濃湯、煮熟的豆類及肉卷。若食物處理不當或有欠衞生，便有可能把細菌帶進廚房，導致已熟的食物受生的配料污染。

產氣莢膜梭狀芽孢桿菌的繁殖細胞能在攝氏4至60度的危險溫度範圍內存活，最佳生長溫度為攝氏43度，而其孢子則可抵受極端的溫度。吃下大量繁殖細胞或其孢子（每克食物含多於100萬個孢子或細胞）才會引致食物中毒。腸毒素在孢子發芽期間產生，會一直保留在細胞內，直到細胞裂解和成熟的孢子一起釋出。在進食受污染的食物後，繁殖細胞可在腸道內產生孢子並釋出腸毒素，繼而引致腸胃炎，症狀包括水狀腹瀉及腹痛。病發時間一般為10至12小時，而患者通常可於24至48小時內康復。

## 熱處理不足及冷卻過程緩慢 – 常見的風險因素

進食未煮熟的食物和食物冷卻時間過長都是導致產氣莢膜梭狀芽孢桿菌中毒的主要原因，特別是在大量配製食物的環境下。未有煮熟食物，或未能消除受污染食物中的產氣莢膜梭狀芽孢桿菌繁殖細胞，細菌仍可繼續滋長。在一些情況下，配製食物時烹煮溫度雖然足夠，但熱源發出的熱力因未能平均分布也可導致食物沒有徹底煮熟。肉卷等食物由於熱力滲透到食物中心的速度較慢，因此即使經過熱力處理，仍有可能未被煮熟，故其風險較高。在上述懷疑食物中毒個案中，醃製豬扒在煎炸後已被切開檢查肉質的顏色變化。單憑觀察所見來判斷豬肉有否徹底煮熟並不是可靠的方法。

部分人或會表示，經徹底煮熟的食物便必定安全；然而，對常見與產氣莢膜梭狀芽孢桿菌中毒有關的食物，應採取額外的預防措施。徹底烹熟食物能殺死繁殖細胞，但產氣莢膜梭狀芽孢桿菌產生的孢子不能被普遍烹煮溫度的熱力消除，或仍於食物中存活。加熱會誘發孢子萌發之餘，緩慢冷卻煮熟的食物更會讓細菌有時間大量滋生。外國的報導指出，讓食物緩慢冷卻或放置在室温下多個小時均是已知的中毒成因。產氣莢膜梭狀芽孢桿菌中毒事故較有可能在護養院及學校等需要向多人提供食物的場合出現，因為在配製後分發熟食或需時較長，而且維持食物存放在安全温度也較難。此外，若要把大量食物放進雪櫃，食物內的熱能或仍在食物內沒有散失。在冷卻期間把食物長時間暴露在危險温度範圍，可為細菌提供有利繁殖的條件。


*圖2: 產氣莢膜梭狀芽孢桿菌中毒的風險因素和控制措施*
*Figure 2: Risk factors of Clostridium perfringens food poisoning and control measures*

Recently, there was a suspected food poisoning outbreak in sheltered workshops associated with meals from a food factory. The incriminated food item was suspected to be pork with gravy and the probable causative agent was *Clostridium perfringens*. *Clostridium perfringens* is reported to be a common cause of foodborne illness. The risk factors for food poisoning caused by *Clostridium perfringens* will be covered in this article along with control measures to reduce food safety risks.

## How does *Clostridium perfringens* cause food poisoning?

*Clostridium perfringens* is a spore-forming bacterium widely found in the environment including soil and water. Incriminated food items linked to *Clostridium perfringens* are high-starch and high-protein items such as gravies, thick soups, cooked beans and rolled meat. Unhygienic and improper food handling practices could introduce the bacteria to kitchens, resulting in the contamination of cooked food by raw ingredients.

While vegetative cells of *Clostridium perfringens* can survive within the temperature danger zone of 4-60°C and grow best at its optimal temperature of 43°C, spores can survive at extreme temperatures. Ingesting a large number of vegetative cells or their spores (>$10^6$ spores or cells per gram of food) is required to cause food poisoning. Enterotoxin is produced during sporulation and remains enclosed within the cells until cell lysis occurs to release the mature spores. When contaminated food is consumed, the vegetative cells can form spores and release enterotoxins in the gut, which could lead to gastroenteritis with symptoms like watery diarrhoea and abdominal pain. The onset time is usually about 10-12 hours and the recovery time is around 24-48 hours.

## Inadequate Heat Treatment and Slow Cooling Procedures – Common Risk Factors

Consuming undercooked food and long cooling time are major contributing factor of *Clostridium perfringens* food poisoning, especially in settings where food is prepared in large volume. Undercooking may not eliminate the vegetative cells of *Clostridium perfringens* in contaminated food and bacterial growth could still take place. In some cases, food is subject to adequate cooking temperature during preparation, but uneven heat distribution from the heat source could also lead to food not being thoroughly cooked. Food items such as rolled meats could be risky due to slow heat penetration to the core, so they may be still undercooked after heat treatment. In the said suspected food poisoning case, the marinated pork chop was checked by cutting and checking the colour change of the meat after deep frying. Such observation findings may not be reliable in judging whether the pork is thoroughly cooked.

Some may claim that thoroughly cooked food is always safe, yet extra precautions should be taken for food commonly linked to *Clostridium perfringens* food poisoning. Thorough cooking can kill vegetative cells, but spores formed by *Clostridium perfringens* are not destroyed by normal cooking temperature and may survive in food. While heating activates spore germination, slow cooling of cooked food allows time for the growing of bacteria to a large number. Overseas reports indicated that allowing foods for slow cooling or leaving foods unrefrigerated for hours are known contributing factors. *Clostridium perfringens* food poisoning is more likely to happen in settings involving large groups of people to be served, like nursing homes and schools, since it may take a longer duration to serve cooked food after preparation while maintaining the food at a safe temperature may also be difficult. In addition, if large amounts of food have to be refrigerated, heat energy may still be trapped in the food. Exposing food within the temperature danger zone for a prolonged period during cooling could provide favourable conditions for bacterial proliferation.

## 徹底煮熟、正確進行冷卻及正確貯存度 - 主要控制措施

要減低產氣莢膜梭狀芽孢桿菌中毒的風險，必須確保食物在中心溫度達到最少攝氏75度下徹底煮熟。正確的烹煮溫度能殺死繁殖細胞。最好使用食物溫度計檢查食物中心溫度，把溫度計插進肉的最厚部分的中央，不應接觸到骨頭或容器的四周。食用剩餘食物前，應徹底翻熱至滾燙，不應翻熱超過一次。

熟食應盡快存放在正確熱存（攝氏60度以上）或冷存（攝氏4度或以下）溫度，以減少暴露在危險溫度範圍的時間。配料和熟食應妥為貯存，以免受污染。把食物分成小份放在較淺的容器內，能加快冷卻過程。若要把食物置於室溫下，最好遵從「2小時/4小時法則」。

## Cooking Thoroughly, Proper Cooling and Proper Holding Temperatures - Key Control Measures

To reduce the risk of *Clostridium perfringens* food poisoning, it is essential to ensure that food is thoroughly cooked with the core temperature of the food reaching at least 75°C. Proper cooking temperature kills vegetative cells. Ideally, a food thermometer is used to check the core food temperature. It should be inserted into the centre of the thickest part of the food and it should not touch a bone or the side of the container. Leftovers should be reheated thoroughly before consumption and should not be reheated more than once.

When storing cooked foods, they should be kept at proper hot (above 60°C) or cold (at or below 4°C) holding temperatures as soon as possible to minimise the time exposed within the temperature danger zone. Ingredients and cooked food should be kept properly to avoid contamination. Dividing food into smaller portions and placing food in shallow containers can facilitate the cooling process. Whenever food has to be kept at room temperature, it is best to follow the "2-hour/4-hour rule".

# 確保網購食品雜貨的食物安全
# Maintaining Food Safety for Online Grocery Shopping

網購食品雜貨簡單方便，因而近年大受歡迎。網店經營者及送遞商必須實施安全措施，以免食物在配製、儲存和運送過程中受污染或變質。容易變壞的食品（如冷凍或冷藏類食物）須採取嚴格的溫度及時間控制措施。

網店經營者應者應向消費者提供清晰的資料，包括食物標籤、食用限期及有關交付食物的安排。此外，網店及送遞商應確保員工在個人、環境及食物衞生方面得到充足的培訓。

消費者需了解網購食物的性質和潛在風險；選擇領有牌照的食物業處所，並在購買受限制出售的即食食物如蠔隻時，應尋找持有適當許可證的網上商店。確保在預定的時間有人接收食物。收貨後，應即時檢查，如有任何問題，例如發現冷藏食物已解凍、包裝破損或罐頭膨脹，切勿食用有關食物並盡快將之退回給供應商。

The convenience of online grocery shopping has made it popular in recent years. Operators of online shops and delivery agents must implement safety measures to reduce the possibility of food contamination or spoilage during preparation, storage and transportation. Perishable food items, such as frozen or refrigerated foods, require stringent temperature and time control.

Operators of online shops should provide consumers with clear information, including food labels, expiry dates and delivery arrangements. Additionally, shops and delivery agents should ensure that their employees receive sufficient training on personal, environmental and food hygiene.

Consumers need to be aware of the nature and potential risks of the food ordered online. Choose licensed food premises, and look for online shops with appropriate permits when purchasing restricted food like oysters for raw consumption. Make sure that someone is available at the scheduled time to accept the food delivered. Upon receiving the food, perform an immediate check. If any issue such as frozen food that arrived thawed, damaged packaging or swollen cans arises, do not consume those food items and return them to the vendor promptly.

# 安全使用煎炸油
# Safe Use of Oil for Deep-frying

煎炸是一種流行的烹調方法，可為食物增添酥脆和金黃的色澤。在油炸時可採取一些步驟，以減少不良的化學反應，並提升食物安全和品質。

選用單元不飽和脂肪酸含量較高的油，例如菜籽油及高油酸葵花籽油，因為這些油在高溫下較為穩定。應盡量減少食物中的水分，並避免在食物表面沾上多餘的炸漿和麵包糠塗層。應把油溫保持在攝氏150-180度之間，因為油溫過高會加快食油分解，繼而加速產生縮水甘油脂肪酸酯(GE)及氯丙二醇脂肪酸酯(3-MCPDE)等加工過程污染物，而油溫過低則會增加食物的吸油量。在閒置時，應將油的溫度降至攝氏120-130度。關掉爐具時，應把油蓋好，以減少油與光線及空氣的接觸。定時清理炸爐中的殘渣並清潔炸爐。煎炸油若有異常顏色或氣味，或開始冒煙或出現泡沫，便應更換。

Deep-frying is a popular cooking method which can add crispiness and a golden colour to food. When deep-frying, steps can be followed to minimise undesirable chemical reactions and enhance food safety and quality.

Select oil with higher levels of monounsaturated fatty acids like rapeseed oil and high-oleic sunflower oil, as they are more resilient at high temperatures. Moisture in food should be minimised and excessive batter and breadcrumb coating should be avoided. Keep the oil temperature at between 150-180°C as too high of a temperature can accelerate the breakdown of oil and the production of process contaminants like glycidyl esters (GE) and 3-monochloropropane-1,2-diol esters (3-MCPDE), while too low of a temperature will increase the amount of oil absorbed. Reduce the oil temperature to 120-130°C when idling. Cover the oil to minimise the exposure to light and air when heating is off. Remove residues and clean the fryer regularly. Change the frying oil when it has unusual colour or odour, or starting to smoke or foam.

# 風險傳達工作一覽（二零二四年二月）
## Summary of Risk Communication Work (February 2024)

| | | | | |
|---|---|---|---|---|
| 事故/ 食物安全個案 Incidents/ Food Safety Cases: 389 | 公眾查詢 Public Enquiries: 115 | 業界查詢 Trade Enquiries: 151 | 食物投訴 Food Complaints: 486 | 給業界的快速警報 Rapid Alerts to Trade: 7 |
| 給消費者的食物警報 Food Alerts to Consumers: 4 | 懷疑食物中毒個案通報 Suspected Food Poisoning Alerts: 1 | 教育研討會/ 演講/ 講座/ 輔導 Educational Seminars/ Lectures/ Talks/ Counselling: 59 | 上載到食物安全中心網頁的新訊息 New Messages Put on the CFS Website: 56 | |