



本期內容 IN THIS ISSUE

- ❖ 即食食物中的諾如病毒
- ❖ 確保夏季食物安全
— 有何挑戰與最佳做法
- ❖ 安全配製和處理意大利芝士蛋糕
- ❖ 閱讀食物標籤，減低食物過敏風險
- ❖ 風險傳達工作一覽
- ❖ Norovirus in Ready-to-eat Food
- ❖ Ensuring Food Safety During Summer
- Challenges and Best Practices
- ❖ Safe Preparation and Handling of Tiramisu
- ❖ Read Food Labels to Reduce the risk of Food Allergy
- ❖ Summary of Risk Communication Work

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即食食物中的諾如病毒 Norovirus in Ready-to-eat Food

食物安全中心風險傳達組
科學主任游天頌先生報告

Reported by Arthur YAU, Scientific Officer,
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諾如病毒是具有高度傳染性的病原體，僅需10至100個諾如病毒粒子即可致病，亦是全球急性腸胃炎的首要病因。在2022年，它導致了歐盟最多的人類疫情爆發，並在美國佔所有由食物傳播的疾病個案一半左右。諾如病毒不易消除，而且可由冰點至攝氏60度的廣闊溫度範圍內存活，並能在含氯達百萬分之十的水中存活，故而惡名昭彰。感染個案較常見於比較寒冷的月份，症狀包括肚痛、噁心、嘔吐和腹瀉。大部分患者會在一兩天內痊癒，但較容易受影響的人士如長者、幼兒及免疫力較弱的人情況或會較為嚴重，有時甚至會導致死亡。

諾如病毒是如何傳播的？

諾如病毒的唯一已知宿主是人類，主要經糞口途徑傳播，也可以通過嘔吐物飛沫在人與人之間接觸傳播。正如一些國家所報告的，近年這種傳播方式，比食源性感染影響了更多的人。諾如病毒的主要傳播途徑為：

1. **受污染的食物**：進食在源頭已受污染的食物是一個重大風險。蠔等貝類及其他雙貝類能積聚受污染的水中的諾如病毒。此外，尤其在食物處理人員出現病徵時，若在處理生食、手機、金錢、垃圾或如廁後沒有洗手，便可能令即食食物被交叉污染。
2. **環境污染**：諾如病毒可以在不銹鋼、陶瓷、工作枱面等各種表面存活一天或以上，因此可能通過接觸受污染的器具或表面傳播。
3. **不潔的手**：受感染者的糞便和嘔吐物中可能帶有諾如病毒，因而污染雙手。若他們在如廁後沒有正確洗手，便能將諾如病毒傳播至食物及各種接觸面。值得注意的是，酒精搓手液未能有效殺死諾如病毒，不能代替以肥皂和清水洗手。

Norovirus is a highly contagious pathogen, with as few as 10 to 100 norovirus particles to make someone ill. It is the leading cause of acute gastroenteritis worldwide. It causes the highest number of human outbreaks in the European Union in 2022 and about half of all outbreaks of food-related illnesses in the United States. It is notoriously difficult to eliminate. Norovirus can survive a wide range of temperatures from freezing point to 60°C, and endure chlorine-treated water at levels up to 10 ppm. Outbreaks are more prevalent during colder months, and symptoms include abdominal pain, nausea, vomiting and diarrhoea. While most people will recover within a day or two, it can be severe for people of vulnerable groups, such as the elderly, young children, and those with weakened immune systems, sometimes resulting in death.

How is Norovirus Transmitted?

The only known host of norovirus is humans; it is spread primarily through the faecal-oral route. It can also be transmitted from person to person via droplets of vomit, which is increasingly affecting more people than foodborne outbreaks in recent years as reported in some countries. The key transmission routes of norovirus are:

1. **Contaminated Food**: Consuming food contaminated at its source is a major risk. Shellfish like oysters and other bivalves can concentrate norovirus from polluted water. Besides, cross-contamination of ready-to-eat food by food handlers may occur, if they do not wash their hands after handling raw food, mobile phones, money, rubbish or using the toilet, especially when they are symptomatic.
2. **Environmental Contamination**: Norovirus can survive on various surfaces like stainless steel, ceramic, countertops, etc. for a day or more, allowing transmission via contact with contaminated utensils or surfaces.
3. **Dirty Hands**: Infected individuals can shed norovirus in their faeces and vomit, contaminating their hands. If they fail to wash their hands properly after using the toilet, they can spread norovirus to food and surfaces. Notably, alcohol-based hand sanitizers cannot substitute hand washing as they are ineffective against norovirus.



圖1：較易受諾如病毒污染的食物，包括貝類、水果（特別是漿果類）、沙律及三文治

Figure 1: Foods that are likely to be contaminated with norovirus, including shellfish, fruits (particularly berries), salads and sandwiches

常見受諾如病毒污染的即食食物

多種即食食物均曾涉及在多國爆發的諾如病毒個案，包括：

- **三文治**：三文治往往需要多重人手處理，加上進食時不再加熱，因此增加了污染的風險。

Common Ready-to-eat Foods Contaminated with Norovirus

Numerous ready-to-eat foods have been linked to cases of norovirus outbreaks in many countries, including:

- **Sandwiches**: These often require extensive handling, increasing the chance of contamination since they are consumed without any further heating.

- **貝類**：蠔隻及其他雙貝類會積聚受污染水中的諾如病毒，尤其是在生吃或未有徹底煮熟。
- **沙律**：新鮮農產品，特別是葉菜可能會因灌溉用水骯髒而被污染，或在配製過程中受污染。
- **水果**：鮮果或會沿食物鏈受不潔的水或手污染。過去的爆發事涉及及最多的是冷藏的漿果類如紅桑子（覆盆子），因為冷藏無法殺死諾如病毒。

維持良好環境衛生的重要性

良好衛生規範至關重要。除洗手外，食物預備區內的各個表面必須定時清潔和消毒。嘔吐時，諾如病毒可經空氣傳播，因此必須清理。清理嘔吐物或糞便時，以[1比49稀釋的家用漂白劑](#)進行消毒：

1. 穿著保護衣物，包括即棄手套和口罩。使用即棄紙巾進行清理，避免使用拖把。
2. 以1比49稀釋的漂白劑消毒受污染的地方，再待15-30分鐘以有效消滅病毒。
3. 用水清洗並抹乾。
4. 脫下即棄手套，然後[徹底洗手](#)。

預防策略

要[預防諾如病毒感染](#)，從農場及個人層面控制諾如病毒非常重要：

1. **徹底煮熟食物**：確保貝類加熱至較高的中心溫度即攝氏90度並維持90秒，或在攝氏100度的沸水烹煮至外殼打開後再煮3至5分鐘。
2. **保持良好手部衛生**：用梘液及清水徹底洗手最少20秒，並確保有梘液及紙巾供員工使用。
3. **避免交叉污染**：使用獨立的器具和砧板處理生食及即食食物，並定時清潔和消毒食物預備區。
4. **教育並監管食物處理人員**：定期培訓員工有關良好衛生規範及與諾如病毒相關的風險。員工應認識遵循良好個人衛生習慣和妥善處理食物的重要性。出現感染症狀的食物處理人員須於症狀消失最少48小時後才再次處理食物。

總括而言，諾如病毒因容易傳播而構成重大風險。預防諾如病毒從農場到餐桌或經人傳人途徑傳播，可以為大眾確保食物安全。

- **Shellfish**: Oysters and other bivalves, especially when consumed raw or undercooked, can accumulate norovirus from polluted waters.
- **Salads**: Fresh produce, especially leafy greens, may be contaminated by polluted irrigation water or during preparation.
- **Fruits**: Fresh fruits can become contaminated with unclean water or hands along the food chain. Frozen berries, such as raspberries, were predominant in past outbreaks, as freezing cannot kill norovirus.

Importance of Maintaining Good Environmental Hygiene

Good hygiene practices are crucial. Other than handwashing, surfaces in food preparation areas must be cleaned and disinfected regularly. Norovirus can become airborne during vomiting, making clean-up essential. When cleaning up vomitus or stools, use a [1:49 household bleach solution](#) for sanitation:

1. Wear protective gears, including disposable gloves and face masks. Use disposable towels for cleaning up and avoid using mops.
2. Disinfect the contaminated area by applying the 1:49 bleach solution, leaving it for 15 to 30 minutes to effectively inactivate the virus.
3. Rinse with water and dry the area.
4. Remove disposable gloves and [wash hands thoroughly](#) afterwards.

Prevention Strategies

To [prevent norovirus infections](#), it is vital to control norovirus at both farm and individual levels:

1. **Cook Food Thoroughly**: Ensure that shellfish are cooked to a higher core temperature of 90°C for 90 seconds, or is boiled at 100°C until shells open, continuing for 3 to 5 minutes.
2. **Maintain Good Hand Hygiene**: [Wash hands](#) thoroughly with liquid soap and water for at least 20 seconds and ensure that liquid soap and paper towels are readily available for staff to use.
3. **Avoid Cross-Contamination**: Use separate utensils and cutting boards for raw and ready-to-eat foods, and regularly clean and sanitise food preparation areas.
4. **Educate and Monitor Food Handlers**: Provide regular training on good hygiene practices and the risks associated with norovirus. Staff should understand the importance of adhering to good personal hygiene and proper food handling. Food handlers who exhibit symptoms of infection, such as vomiting or diarrhoea, should refrain from handling food until they have been symptom-free for at least 48 hours.

In summary, norovirus poses a significant risk due to its ease of transmission. By preventing the spread of norovirus from farm to fork and from person to person, one can ensure food safety for all.

確保夏季食物安全－有何挑戰與最佳做法 Ensuring Food Safety During Summer - Challenges and Best Practices

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

夏日時光充滿歡樂，無論在室內場所如學校和派對房間或室外場地像海灘和遊艇，處處都是愉悅的氣氛與親友共享美味佳餚。然而，過去在夏季活動中發生的食物中毒事故卻確切地提醒我們，配製食物的分量增加、聚會人數眾多及用餐時間長等都會增加食物中毒事故發生的風險。常見的挑戰包括交叉污染和不當貯存溫度，能輕易把歡慶場合變成對健康的危害。一般來說，夏季有利於食源性致病菌生長，而每當溫度上升攝氏10度，微生物細胞的生長速度便會增加一倍，直至達到最佳生長溫度。其中，副溶血性弧菌和金黃葡萄球菌的最佳生長溫度均為攝氏37度。本文將探討夏季多人聚餐時的重大食物安全挑戰，並分享實用技巧，讓大家吃得安全又盡興。

Summer is a fun time filled with happiness, and tasty meals shared with family and friends ranging at both indoor locations like schools and party rooms and outdoor venues such as beaches and yachts. However, previous food poisoning outbreaks at summer events starkly remind us that the increased volumes of food preparation, large gatherings and extended meal times raise the risk of food poisoning outbreaks. Common challenges including cross-contamination and improper storage temperatures can easily turn celebrations into health hazards. In general, food poisoning organisms grow well in summer, and the growth rate of microbial cells doubles when the temperature increases by 10°C until it reaches the optimal growth temperature. The optimal temperature for the growth of *Vibrio parahaemolyticus* and *Staphylococcus aureus* are 37°C. This article will explore major food safety challenges during large food gatherings in summer, and share practical tips to keep meals safe and fun for everyone.

面對挑戰－交叉污染和不當貯存溫度

食物預備區和廚房經常處理多種食物，包括生食、即食食物及熟食。若這些食物用相同的工具處理、放在同一儲存格或同一空間加工時近距離放置，就可能發生交叉污染。某些高危險配料（例如受沙門氏菌污染的蛋類或帶有諾如病毒的蠔隻）若是處理或加工不當，便會對食物安全構成嚴重威脅。食物處理人員若在配製食物期間沒有正確清洗雙手，同樣可造成污染。進食受污染的食物能引致食源性疾病。

另一關鍵風險是溫度控制不當，使食物長時間置於攝氏4度至60度的危險溫度範圍內，有利引致食物中毒的細菌加速繁殖。提前大量配製食物、不正確的解凍步驟以及人手不足，都容易導致食物配料長時間存放於不安全的溫度，尤其在炎熱的夏日。此外，部分送遞食物的方法如派對到會服務若沒有適當處理食物，或會在沒有妥善溫度控制的情況下展示食物。若貯存溫度不當，部分食物如冰凍甜點或會溶掉，而某些食物即使出現致病菌滋生的情況也可能沒有明顯變壞迹象。

熱處理不足或不均勻同樣會導微生物於烹煮後在食物中存活並繁殖。大量配製的菜式，例如厚切的燒烤或煙燻肉類，在食物表層下可能有未煮熟部分。同樣地，煎炸及微波爐加熱或無法讓足夠的熱力穿透食物，使食物某些部分處於不安全的溫度，讓病原體得以存活和繁殖。

減低風險的最佳做法－食物安全五要點

要有效減低食物安全風險，實行食物安全五要點尤為重要：（一）分開生熟食物－分開貯存生的食物、即食食物和熟食（最好使用不同雪櫃），若需共用一部雪櫃，應把生的食物放進有蓋容器並置於即食食物和熟食下面；（二）防止交叉污染－在不同且清晰劃分的食物預備區使用獨立和專用的器具分開處理生的食物、即食食物和熟食，並確保所有器具和設備均在使用前妥為消毒；及（三）洗手－用水和視液徹底搓手20秒，以保持良好手部衛生。

維持安全的食物溫度對於防止食物變壞和細菌滋生至關重要。非立即食用的即食食物和熟食應存放在攝氏4度或以下（冷食）或攝氏60度以上（熟食）。冷藏食物僅可採用以下方式解凍：把食物從雪櫃的冰格轉移至保鮮格、放在流動的冷自來水下或使用微波爐。食物絕不應置於室溫下解凍。對於危險溫度範圍（攝氏4度至60度）內的食物，須遵從「2小時 / 4小時原則」。

為確保食物已徹底煮熟，應將食物溫度計放進食物最厚部分的中心（避開骨頭或容器內壁），以確認中心溫度達至攝

Encountering the Challenges – Cross-contamination and Improper Temperatures

Food preparation areas and kitchens often handle a variety of items including raw, ready-to-eat (RTE) and cooked foods. Cross-contamination can occur when these foods are handled by using the same sets of utensils, kept in the same storage compartments or processed in the same area in close proximity. Certain high-risk ingredients, such as eggs contaminated with *Salmonella* or oysters carrying norovirus, pose significant food safety threats if not handled and or processed properly. Contamination can also occur if food handlers do not properly wash their hands during food preparation. The consumption of contaminated food can lead to foodborne illness.

Another critical risk is improper temperature control, which allows food to remain in the Temperature Danger Zone from 4°C to 60°C, which facilitates the proliferation of food poisoning-causing bacteria. Large-scale food preparation in advance, incorrect defreezing procedures and insufficient staff can lead to food ingredients being left at unsafe temperatures for prolonged periods, especially in hot summer. In addition, some food serving methods like party catering services may let food be displayed under conditions lacking proper temperature control, if the food is not properly handled. Some foods such as frozen confections may melt when they are stored at improper temperatures while other foods may harbour pathogen growth without obvious signs of spoilage.

Inadequate or uneven heat treatment can also lead to the survival and growth of microorganisms in foods after cooking. Dishes prepared in bulk, such as thick cuts of barbecued or smoked meats, may have undercooked portions underneath food surfaces. Similarly, frying and microwave oven heating may fail to deliver sufficient heat penetration, leaving portions of food at unsafe temperatures and allowing pathogens to survive and proliferate.

Best Practices to Reduce the Risks - Five Keys to Food Safety

To effectively minimise food safety risks, implementing the [Five Keys to Food Safety](#) is essential: (i) segregate food – store raw, RTE, and cooked items separately (ideally in different refrigerators). If foods share one unit, place raw foods in covered containers below RTE and cooked foods; (ii) prevent cross-contamination – use separate and dedicated utensils for raw, RTE and cooked foods in different food preparation areas with clear demarcation; ensure all utensils and equipment are properly sanitised before use; and (iii) wash hands – scrub with water and liquid soap for 20 seconds thoroughly to maintain good hand hygiene.



Choose
Choose safe
raw materials

精明選擇
選擇安全的
原材料



Clean
Keep hands and
utensils clean

保持清潔
保持雙手及
用具清潔



Separate 生熟分開
Separate raw 分開生熟食物
and cooked
food



Cook 徹底煮熟
Cook thoroughly 徹底煮熟食物



Safe temperature 安全溫度
Keep food at
safe temperature 把食物存放
於安全溫度

圖2：食物安全五要點
Figure 2: Five Keys to Food Safety

Maintaining safe food temperatures is critical to preventing spoilage and bacterial growth. Store RTE and cooked foods not for immediate use at ≤4°C (cold foods) or >60°C (hot foods). Defrost frozen foods only by moving them from the freezer to the fridge, placing them under cold running water or microwaving. Never leave them at room temperature to defrost. Adhere to the 2-hour/4-hour rule for food items in the Temperature Danger Zone (4–60°C).

氏75度或以上，並維持至少15秒。蠔隻及貝類須加熱至攝氏90度並維持90秒，或在攝氏100度的沸水中煮開，然後再煮3至5分鐘。溫度計不應接觸到骨頭或容器的四周。如沒有食物溫度計，應徹底煮熟或翻熱食物，例如煮沸湯羹及焗燉類食物，並維持至少1分鐘，並在煮蛋時煮至蛋黃凝固。使用微波爐烹煮時，應在每個加熱時段之間攪拌和翻動食物，以去除冷點並確保熱力平均分布。

To ensure foods are cooked thoroughly, insert a food thermometer into the centre of the thickest part of the food (avoiding bones and container walls) to confirm the core temperature reaches at least 75°C for at least 15 seconds. For oysters and shellfish, they have to be heated to 90°C for 90 seconds or boiled at 100°C and continued for 3 to 5 minutes. The thermometer should not touch a bone or the side of the container. If no food thermometer is available, cook or reheat food thoroughly, e.g., boiling soups and stews for at least 1 minute and cooking eggs until the yolks are firm. When microwaving, stir and rotate food between each heating cycle to eliminate cold spots and ensure even heat distribution.

安全配製和處理意大利芝士蛋糕 Safe Preparation and Handling of Tiramisu

意大利芝士蛋糕是廣受歡迎的冷凍甜品，常以手指餅、馬斯卡邦芝士、忌廉、蛋、可可粉、糖、鹽、咖啡及葡萄酒等配料製作。由於意大利芝士蛋糕無須烘焙，加上有些食譜使用生蛋，在**本港**與進食意大利芝士蛋糕相關的**沙門氏菌食物中毒**個案時有報道。

應向信譽良好的供應商購買配料。購買或接收配料時，要確保配料狀況良好及未過“此日期或之前食用”日期。因為生蛋或帶有沙門氏菌，僅應使用經巴士德消毒的蛋製品而非生蛋來製作意大利芝士蛋糕。經巴士德消毒的蛋類須妥善貯存，開封後應盡快使用。切勿在不同批次經巴士德消毒的蛋類製成的蛋漿添加一起，或將其與任何生蛋混合。保持良好個人及環境衛生，以防止交叉污染，因為製作過程涉及多重人手處理。製成品應蓋好並存放在攝氏4度或以下，以防變壞。欲知更多資料，請瀏覽食物安全中心網頁，以參閱**安全製作甜品的業界指引**。

Tiramisu is a popular chilled dessert that is often made with ladyfinger biscuits, mascarpone cheese, cream, eggs, cocoa powder, sugar, salt, coffee and wine, etc. Since tiramisu requires no baking and some recipes call for the use of raw eggs, [local cases of Salmonella food poisoning](#) linked to the [consumption of tiramisu](#) are reported from time to time.

Purchase ingredients from reputable suppliers. Ensure that ingredients are in good condition and within the use-by dates during purchasing or receiving. Do not use raw eggs in tiramisu, as raw eggs may carry *Salmonella*. Use pasteurised egg products only instead. Store pasteurised egg products properly and use them soon once opened. Do not top up batches of pasteurised egg preparations or blend them with any raw eggs. Maintain good personal and environmental hygiene to prevent cross-contamination, since extensive manual handling is required during preparation. Cover the finished dessert and store it at 4°C or below to prevent spoilage. Visit the Centre for Food Safety's website for the [Trade Guidelines on Safe Production of Sweet Food](#) for details.

閱讀食物標籤，減低食物過敏風險 Read Food Labels to Reduce the risk of Food Allergy

食物過敏是指人體免疫系統對食物中某些物質產生反應。如身體對某種物質過敏，即使分量很少也能引起過敏反應。一般來說，免疫系統能保護人體免受病原體侵害，但在食物過敏的情況下，免疫系統卻錯誤地將某些食物成分識別為威脅。常見已知的食物致敏物包括麩質、甲殼類動物、蛋類、魚類、花生、大豆、奶類、木本堅果及亞硫酸鹽。

食物過敏的症狀包括臉部、舌頭或嘴唇腫脹，情況嚴重者可在攝入致敏物後引致過敏性休克，一種急性且可能致命的過敏反應。為避免食物引起的過敏反應，市民應細閱食物標籤上的致敏物和配料資料，了解食物有否會令自己過敏的成分。業界必須遵從《食物及藥物(成分組合及標籤)規例》(第132W章)的規定，在預先包裝食物加上可閱的標記或標籤，用以表列食物的配料。如食物由致敏物組成，或含有致敏物，該致敏物的名稱須在配料表中列明。

Food allergy is a reaction of the body's immune system to some substances in food. Even a very low level of an allergenic substance can trigger an allergic reaction in susceptible individuals. The immune system normally protects the body from pathogens, but in cases of food allergies, it mistakenly identifies some components of food as threats. Common known allergens include gluten, crustacea, eggs, fish, peanuts, soybeans, milk, tree nuts and sulphite.

Symptoms of food allergy include swelling of the face, tongue or lips. In severe cases, anaphylactic shock, an acute and potentially life-threatening allergic reaction, can occur after exposure to allergens. To avoid allergic reactions from food, the public should read food allergen information and ingredients on food labels carefully to check for allergens of concern. The trade must follow requirements as listed in the Food and Drugs (Composition and Labelling) [Regulations](#) (Cap. 132W), which require that prepackaged food be legibly marked or labelled with a list of ingredients. If a food consists of or contains allergens, the name of the substance shall be specified in the list of ingredients.



風險傳達工作一覽 (二零二五年七月)

Summary of Risk Communication Work (July 2025)

事故/ 食物安全個案 Incidents/ Food Safety Cases: 344	公眾查詢 Public Enquiries: 130	業界查詢 Trade Enquiries: 205	食物投訴 Food Complaints: 559	給業界的快速警報 Rapid Alerts to Trade: 4
給消費者的食物警報 Food Alerts to Consumers: 2	懷疑食物中毒個案通報 Suspected Food Poisoning Alerts: 0	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: 54	