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燒味與食物安全 Siu Mei and Food Safety

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,
Risk Communication Section, Centre for Food Safety

二零二三年六月，食物安全中心（食安中心）調查連串涉及進食燒味的食物中毒個案。患者出現腹痛、腹瀉和嘔吐等腸胃不適症狀。涉事食物為燒味菜式，而引致食物中毒的病原體懷疑是沙門氏菌。處理燒味的相關廚房被發現有衛生和食物處理欠佳的問題，包括過早配製燒味、長時間存放在危險溫度範圍、烹煮溫度不足和與生的食物交叉污染。

In June 2023, the Centre for Food Safety (CFS) investigated a cluster of food poisoning outbreaks related to consumption of siu mei. The affected persons complained of gastrointestinal (GI) symptoms including abdominal pain, diarrhoea and vomiting. The incriminated food items were siu mei dishes and *Salmonella* was the suspected causative agent. Hygiene and food handling deficiencies were detected in the siu mei kitchen, including preparation of siu mei too far in advance, prolonged period in the Temperature Danger Zone, inadequate cooking temperatures and cross contamination with raw food.

燒味中常見的病原體

過去發生的燒味食物中毒個案與沙門氏菌和金黃葡萄球菌有關。沙門氏菌會在吃進體內6至72小時後引致腸胃不適，症狀包括噁心、嘔吐、腹部絞痛、腹瀉、發燒和頭痛等。雖然健康人士的感染症狀通常會自行消退，但對高危人士來說則有可能致命。沙門氏菌存在於受污染的水、泥土、食物接觸面和手部，以及動物和人類的腸道中，主要通過糞口途徑和受污染的水傳播。屠宰的過程也有可能污染肉類。

Common Pathogens in Siu Mei

Salmonella and *Staphylococcus aureus* were implicated in past siu mei food poisoning outbreaks. *Salmonella* causes GI illnesses within 6 to 72 hours after oral exposure, with symptoms like nausea, vomiting, abdominal cramps, diarrhoea, fever and headache. While the infection is usually self-limiting in healthy individuals, it may be lethal to [susceptible populations](#). *Salmonella* can be found in contaminated water, soil, food contact surfaces and hands, and in the GI tracts of animals and in humans. It is often spread through the faecal-oral route and contaminated water. Slaughtering can also contaminate the meat.

[金黃葡萄球菌](#)則常見於人類的毛髮、皮膚、鼻腔、喉嚨和傷口。金黃葡萄球菌通過食物處理人員雙手接觸污染食物，尤其是在烹煮完成後。若在烹煮後斬件加上長時間在室溫下貯存，金黃葡萄球菌便可倍增，並產生耐熱的毒素。

On the other hand, *Staphylococcus aureus* bacteria are commonly found on the hair, skin, nasal cavity, throat and wounds of humans. *S. aureus* contaminates food through food handlers' hands, especially after cooking. With post-cooking cutting and prolonged storage at room temperature, the bacterium can grow exponentially and form heat-stable toxins.

產生抗菌素耐藥性的細菌

產生抗菌素耐藥性的細菌不一定是病原體，也可以是在人體內與人類共生的細菌，若

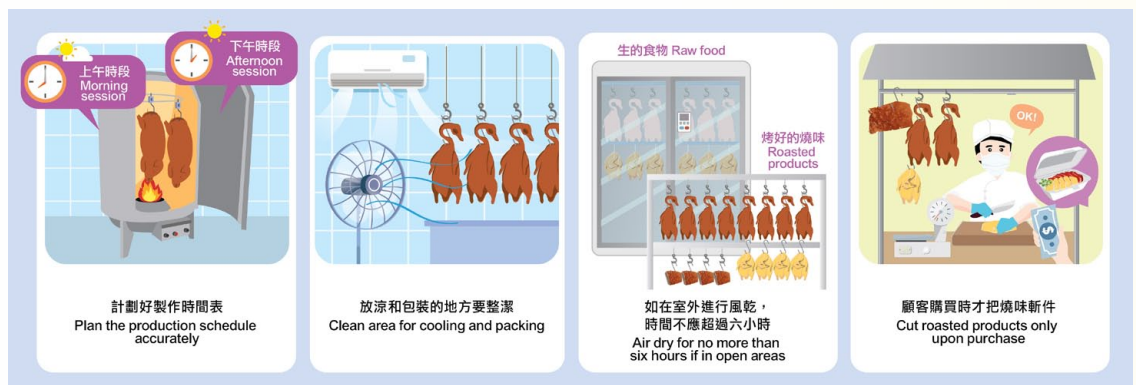


圖1: 妥善製作和出售燒味的例子
Figure 1: Examples of good practices in the preparation and sale of siu mei

不注重食物和手部衛生，便與環境中的其他生物或與人類共生的細菌無異，同樣可污染食物。雖然感染產生抗菌素耐藥性的細菌可以毫無病徵，但微生物仍能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。“[食物安全五要點](#)”所提供的食源性疾病預防方法，同樣能有效減低感染產生抗菌素耐藥性細菌的風險。

應對燒味的食物安全問題

儘管**徹底煮熟**食物能輕易消滅病原體，部分常見的不當做法可引致燒味受污染。

1. 風乾過程不衛生，即環境不潔或風乾時間過長可導致燒味受污染；
2. 在烹煮後及接著包括展示、斬件和運送的處理工序中對燒味保護不周引致的污染；
3. 設備不潔及個人衛生欠佳；
4. 受生或半生不熟的食物交叉污染；
5. 過量製作以致已烹煮的燒味展示時間過長。

製作燒味的食物安全措施

製作

預先計劃精準的製作過程，以免過量製作及延長已烹煮的燒味在室溫下存放的時間。每天分兩個或以上的烤製時段，以配合午市和晚市高峰期的需求，從而減少存放的時間。放入攝氏4度或以下的雪櫃或置於流動自來水下解凍肉類。切勿把肉類置於室溫下解凍。

製作後的處理工序

劃定一處潔淨和遠離生的食物的地方，專門用作放置冷卻和包裝已烹煮的燒味，並使用專用的工具防止交叉污染。保持該處清潔。車輛在運送燒味前，不應用以運送生的食物或化學品。把燒味蓋好，同時預留足夠空間，以免水分積聚。

展示和出售

精準地計劃製作過程，以減少展示時間。燒味應放在防蟲和防塵的展示櫃內陳列，櫃內不可放置生的食物。不應堆疊燒味。如在室溫下陳列燒味，應遵從“[2小時 / 4小時原則](#)”。烤好的燒味應在顧客購買時才斬件。烤好（尤其是已預先包裝）的燒味若需存放在危險溫度範圍內，最好在斬件後兩小時內售出。

注意事項：

1. 沙門氏菌和金黃葡萄球菌等病原體自然寄生在多種動物體內，因此可存在於肉類和肉類製品中；
2. 徹底煮熟食物能消滅多種病原體和產生抗菌素耐藥性的細菌；
3. 正確計劃、製作和處理燒味，並保持個人及環境衛生，能預防微生物污染。

給市民的建議

- 市民購買燒味時，應光顧清潔衛生的持牌店舖。正確存放燒味，並盡快食用。

給業界的建議

- 妥善計劃、製作和處理燒味並保持衛生，能減低出現病原體污染的可能性。如欲了解有關詳情，請瀏覽食安中心的[燒味 - 給食物業的食物安全指引](#)。

Antimicrobial Resistance (AMR) Bacteria

[AMR bacteria](#) are not necessarily pathogens and can be commensal bacteria that derive benefits from their association with humans. Similar to other environmental organisms or commensal bacteria in humans, they can also contaminate food if food hygiene and hand hygiene issues are overlooked. Although infection by AMR bacteria can be asymptomatic, microorganisms gain resistance spontaneously by gene mutation or gene transfer among each other. The strategy as provided in “[Five Keys to Food Safety](#)” for the prevention of foodborne diseases can also effectively reduce the risk of contracting AMR bacteria.

Addressing Food Safety Issues Related to Siu Mei

While the pathogens can be easily killed by [thorough cooking](#), some common malpractices can lead to contamination of siu mei.

1. Unhygienic air-drying process, where siu mei can become contaminated due to dirty environment or prolonged drying time;
2. Contamination due to poor protection of siu mei after cooking and in subsequent handling, including display, cutting and transportation;
3. Dirty equipment and poor personal hygiene;
4. Cross contamination by raw or partially-cooked food;
5. Prolonged display of cooked siu mei due to over-production

Food Safety Measures for Production of Siu Mei

Production

Plan production accurately ahead of time to prevent over-production and extended storage of cooked siu mei at room temperature. Have two or more sessions of roasting daily to cater to peak hours during lunch and dinner so that storage time can be minimised. Defrost frozen meat in a chiller at 4°C or under running water. Do not defrost at room temperature.

Post-production Handling

Designate a clean area away from raw food for the cooling and packing of cooked siu mei with a dedicated set of tools to prevent cross contamination. Keep the area clean. Vehicles for transporting siu mei should not be previously used for transporting raw food or chemicals to prevent contaminations. Keep the siu mei covered while maintaining adequate room to prevent moisture built-up.

Display and Sale

Minimise display time with accurate production planning. Siu mei should be displayed in insect- and dust-proof showcases. No raw food should be allowed in them. Stacking should be avoided. Follow the “[2 hours / 4 hours](#)” rule for display at room temperature. Roasted siu mei should be cut upon purchase. Roasted products, especially pre-packaged ones, are preferred to be sold within 2 hours after cutting if kept in the Temperature Danger Zone.

Key Points to Note:

1. Pathogens like *Salmonella* and *Staphylococcus aureus* can be present in meat and meat products as many animals harbour them naturally;
2. Thorough cooking can kill many pathogens and AMR bacteria;
3. Proper planning, production and handling of siu mei and maintenance of personal and environmental hygiene can prevent microbiological contaminations.

Advice to the Public

- The public should patronise well-maintained licensed premises when buying siu mei. Store them properly and consume as soon as possible.

Advice to the Trade

- With proper planning, production, handling and maintenance of hygiene, the chance of contamination with pathogens can be minimised. For further details, you may refer to the CFS’ [Siu Mei - Food Safety Guidelines for Food Businesses](#).

保障食物安全：正確進行冷卻、解凍和翻熱

Ensuring Food Safety: Proper Cooling, Defrosting and Reheating

食物安全中心風險傳達組
衛生總督察阮佩卿報告

Reported by Ms. Bibiana YUEN, Chief Health Inspector,
Risk Communication Section, Centre for Food Safety

細菌在天氣較為溫暖的夏季會迅速滋長，食物中毒的風險也會隨之增加。在配製食物的各個階段（包括冷卻、解凍和翻熱）中妥善控制溫度，對預防食物中毒至關重要。在本文中，我們將闡述市民和食物業應特別關注的重要食物安全概念，包括危險溫度範圍、正確的冷卻技巧及解凍和翻熱的要點。

The risk of food poisoning increases during the summer season because bacteria grow faster in warmer weather. Proper temperature control throughout various stages of food preparation, including cooling, defrosting and reheating is essential in preventing food poisoning. In this article, we will present important food safety concepts that members of the public and food businesses should pay special attention to, including the Temperature Danger Zone, proper cooling techniques, as well as key points on defrosting and reheating.

什麼是危險溫度範圍？

危險溫度範圍指細菌可在食物中繁殖迅速的溫度範圍，而令感染食源性疾病的風險增加溫度範圍。一般而言，此範圍介乎攝氏4度至60度。有害細菌可在置於危險溫度的食物內滋長，這些細菌偶爾能產生耐熱的毒素，即使翻熱也不能把這些毒素消除。因此，盡量縮短食物存放在危險溫度範圍的時間，對預防細菌繁殖、孢子萌發及可引發食源性疾病的耐熱毒素產生十分重要。迅速冷卻食物並在冷卻後存放在適當的溫度，可減低食物安全風險。

What is Temperature Danger Zone?

The Temperature Danger Zone refers to the range of temperatures where bacteria can rapidly multiply in food, increasing the risk of foodborne illnesses. This zone typically ranges from 4°C to 60°C. Harmful bacteria can grow in food that is left at dangerous temperatures. Sometimes, these bacteria can produce heat-resistant toxins, which cannot be destroyed even by reheating. Therefore, it is crucial to minimise the time that food stays in the Temperature Danger Zone to prevent bacterial multiplication, spore germination and the formation of heat-resistant toxins that can cause foodborne illnesses. Food safety risks can be reduced by cooling food quickly and storing it at proper temperatures after cooling.

冷卻食物—行動要迅速

配製好的食物若不會立即進食，便應妥為冷卻。正確的冷卻方法能減少食物暴露在危險溫度範圍的時間，從而降低滋生細菌的風險。一般來說，可採用二段冷卻法冷卻食物。首先，把食物在2小時內從烹煮的溫度冷卻至攝氏20度，然後再在4小時內用雪櫃把食物由攝氏20度冷卻至攝氏4度（圖2）。要加速冷卻的過程，最好把食物切成較小的塊件或放到有蓋的淺盤內攤開，放在空氣流通的地方。

Cooling Food – Best to Make It Fast

Prepared food that will not be consumed promptly should be cooled properly. Proper cooling can reduce the time that food is exposed to the Temperature Danger Zone, and hence minimise the risk of bacterial growth. In general, a Two-Step Cooling Approach can be used for the cooling of food. First, cool the food from its cooking temperature to 20°C within two hours. Then, cool the food from 20°C to 4°C or below in a refrigerator within the next four hours (Figure 2). To speed up the cooling process, it is preferable to cut the food into smaller pieces or spread it out in shallow, covered containers in an area with good air circulation.

部分食物業經營者或會選擇使用專門的設備如急速冷凍櫃，把熱的食物在1.5小時內快速冷卻至攝氏4度或以下的安全溫度。急速冷凍完成後，應把食物放進雪櫃冷凍或冷藏。

Some food business operators may opt to use specialised equipment such as blast chillers to quickly lower the temperature of hot food to a safe temperature at or below 4°C within 1.5 hours. Such cooling technique can further reduce the time of food being exposed to the Temperature Danger Zone. When blast chilling is done, food should be stored in refrigerators or freezers.

解凍 — 在安全溫度解凍食物為佳

即使食物於攝氏0度或以下冷藏，部分存在於食物內的有害細菌仍有可能在不活躍的狀態下存活。冷藏食物一旦解凍，中心溫度便會上升，細菌便可再次變得活躍並開始繁殖。因此，正確解凍食物對防止滋生有害細菌相當重要。

使用調教至攝氏0至4度的雪櫃、流動的冷自來水或微波爐都可正確解凍食物。保持食物安全的最佳方法是在雪櫃內解凍食物。若食物需要重新冷藏，應利用雪櫃進行解凍，因為這樣能保持食物在解凍的過程中完全離開危險溫度範圍。不要在室溫下解凍食物，此舉會把食物長時間暴露在危險溫度，有利細菌滋長。



圖2: 二段冷卻法和加快冷卻的技巧
Figure 2: Two-Step Cooling Approach and Techniques of Speeding up Cooling

Defrosting – Better to Thaw Food at Safe Temperatures

Even though food is frozen at 0°C and below, some harmful bacteria present in the food may still be alive but just inactive. Once frozen food is thawed, its core temperature will rise and bacteria may start to be active again and multiply. Defrosting food appropriately is therefore important to avoid the growth of harmful bacteria.

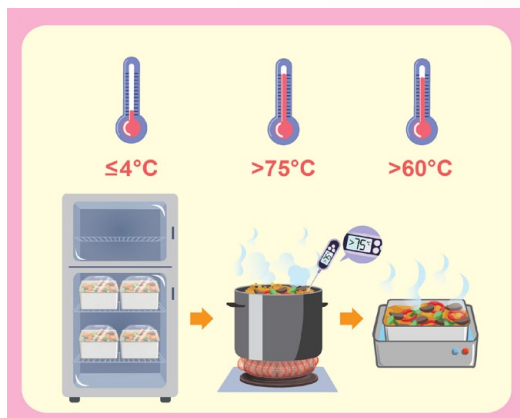


圖3: 在適當溫度翻熱和供應食物
Figure 3: Reheating and serving food at proper temperatures

翻熱 — 進食前的食物安全關鍵

翻熱已烹煮食物應視作重新烹煮而非單純加溫。翻熱食物時，應與烹煮一樣，確保其中心溫度達到至少攝氏75度，維持30秒，然後在攝氏60度以上的正確熱存溫度供應食物（圖3）。食物翻熱後應避免放進雪櫃冷存，因為食物有可

Proper food defrosting can be achieved by using a refrigerator set between 0°C and 4°C, running cold tap water or a microwave oven. The preferred method for keeping food safe is to defrost frozen food in the refrigerator. If refreezing is necessary, defrost food by using refrigerators as food will be consistently kept out of the Temperature Danger Zone during defrosting. Do not defrost food at room temperature, as this exposes the food to dangerous temperatures for an extended period of time, promoting bacterial growth.

Reheating – Key to Secure Food Safety Before Consumption

Reheating precooked food means cooking again, not just warming up. When reheating food, similar to cooking, ensure that the core temperature of the food reaches at least 75°C for 30 seconds and then serve it at a proper hot holding temperature at above 60°C (Figure 3).

能暴露在危險溫度過久，導致細菌滋生。應注意的是，切勿使用隔水保溫鍋或其他僅設計用作熱存的工具加熱食物。這種做法所需的加熱時間或會太長，或加熱的溫度不夠高，不足以確保食物安全。

在配製食物的各個階段中保持妥善溫度控制，是確保食物安全的基本原則。進行有效的冷卻、解凍及翻熱程序是減低食源性疾病感染必須的做法。在每個階段均監察溫度並保存適當的記錄也很重要，因為這樣做能確保在安全溫度下配製食物，同時有助評估熱存和冷卻設備的性能，對保持食物安全水平尤為重要。向員工提供全面培訓，讓他們掌握各自的工作所需的知識和技巧也同樣重要。持續接受培訓對提升安全處理食物的技能發展發揮了關鍵作用。

Avoid refrigerating the food after reheating because bacteria can grow if it stays at dangerous temperatures for too long. Of note, do not try to heat food using equipment like a bain marie or other devices designed solely for keeping food hot. This may take too long or fail to heat the food adequately to keep it safe.

Maintaining proper temperature control throughout the various stages of food preparation is fundamental to ensuring food safety. Implementing effective [cooling, defrosting and reheating](#) procedures are essential practices that could minimise the risk of foodborne illnesses. Proper record keeping for temperature monitoring at each stage is also important as it ensures food preparation occurs at safe temperatures and helps to evaluate the performance of hot-holding and chilling equipment, which is vital for maintaining food safety standards. Equally significant is providing comprehensive training to staff members, equipping them with the necessary knowledge and techniques relevant to their specific roles. Ongoing training plays a pivotal role in skill development for safely handling food.

炒滑蛋的食物安全風險

Food Safety Risk of Soft-scrambled Eggs

七月發生了一宗與進食炒滑蛋菜式有關的懷疑食物中毒個案。調查發現，製作有關菜式時，存放在室溫下混合攪拌而成的蛋液未經煮熟。混合蛋漿常用於製作炒滑蛋，而在製作混合蛋漿的過程中，受污染的蛋會使容器中全部蛋漿都受到污染。為保持理想的質感，蛋類或不會徹底煮熟。進食熱處理不足的受污染蛋類可引致食物中毒。

為減低感染食源性致病菌的風險，蛋類製品應徹底煮熟。為保持所需質感而不會徹底煮熟的菜式，應選用經巴士德消毒的雞類、蛋類製品或蛋粉配製。混合蛋漿應即日用完，若不會立即使用，應貯存在雪櫃內，也不要添加新蛋。如非即時食用，炒滑蛋菜式應保持於適當[貯存溫度](#)。高危人士應避免進食高風險食物，包括生或未經煮熟的蛋。

In July, there was a suspected food poisoning case related to the consumption of soft-scrambled egg dishes. Investigation revealed that pooled liquid eggs, kept at room temperature, had been undercooked to produce the dishes. Soft-scrambled eggs are often produced by pooled eggs, where pooling allows contaminated eggs to contaminate the whole pool of eggs. To maintain the desirable texture, the eggs may not be thoroughly cooked. Consuming contaminated eggs without adequate heat treatment could lead to food poisoning.

To minimise risks of contracting foodborne pathogens, egg products should be cooked thoroughly. For dishes that are not intended to be thoroughly cooked to keep the required texture, choose pasteurised eggs, egg products or dried egg powder. Use all pooled eggs on the same day, refrigerate them when not immediately used and do not top up with new eggs. If not immediately served, soft-scrambled egg dishes should be kept at proper [holding temperature](#). Susceptible populations should not consume high-risk foods including raw or undercooked eggs.

食物中的輻射水平

Radiation Level in Food

由於日本正將福島核電站的核污水排放到海洋，令人關注水產品或會受半衰期較長的放射性物質如銫-137、銻-90和鈾-239污染。長期攝入這些放射性物質或會增加患癌的風險。

因應日本排放核污水的行動，當局已發出《食物安全命令》，禁止所有源自東京、福島、茨城、宮城、千葉、群馬、栃木、新潟、長野和埼玉都/縣，並在二零二三年八月二十四日或之後收穫、製造、加工或包裝的水產品進口。所有來自日本其他地方的水產品均會經過測試，以確認相關產品的輻射水平沒有超出食品法典委員會的指引限值。為提高透明度，分析結果包括所有不合格樣本和驗出含微量輻射的樣本，將於每個工作日公布並上載至食安中心網站。

As Japan is [discharging nuclear-contaminated water from the Fukushima facility into the ocean](#), there are concerns that aquatic products may become contaminated by radionuclides especially those long half-life ones like caesium-137, strontium-90 and plutonium-239. Intake of such radioactive substances over the long run may pose increased cancer risk.

In response to Japan's discharge of nuclear-contaminated water, a Food Safety Order was issued to prohibit the import of all aquatic products originating from Tokyo, Fukushima, Chiba, Tochigi, Ibaraki, Gunma, Miyagi, Niigata, Nagano and Saitama metropolis/prefectures if they are harvested, manufactured, processed or packed on or after 24 August 2023. All aquatic products from other parts of Japan will be tested to verify that the radiation levels of these products do not exceed the Codex guideline levels. To enhance transparency, the analytical results, which include all unsatisfactory samples and samples with a low level of detectable radioactivity detected, are [reported and uploaded onto the CFS website](#) every working day.



風險傳達工作一覽 (二零二三年八月)

Summary of Risk Communication Work (August 2023)

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