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在雪櫃及冰格貯存食物的實用提示

Practical Tips for Food Storage with Refrigerators and Freezers

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,
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雪櫃和冰格是貯存食物必不可少的設備。適當的食品貯存對於確保食物安全和品質至關重要。本文將討論冷凍和冷藏優點和缺點，並闡述何種食物應貯存在雪櫃內、其保存期及在雪櫃內保持食物安全的正確做法。

冷凍與冷藏一有分別嗎？

雖然冷凍及冷藏均可保持食物處於低溫，遠離危險溫度範圍，從而保存食物，但保存的條件卻不盡相同。冷凍的食物在攝氏4度或以下保存，在這種環境下多種細菌的生長會受抑制。大部分冷凍貯存的食物都能保持質感。然而，某些種類的細菌如李斯特菌，在冷凍溫度下仍可以滋長。值得注意的是，李斯特菌若存在，便能隨時間在雪櫃內繁殖並引發食源性疾病。

Refrigerators and freezers are indispensable equipment for food storage. Proper food storage is essential to ensuring food safety as well as quality. This article will discuss the pros and cons of refrigeration and freezing, explain what kinds of food should be stored in the fridge and their storage periods, and the proper practices to keep food safe in the fridge.

Refrigeration versus Freezing – Are They the Same?

While both refrigeration and freezing can preserve food by keeping it cold and out of the [Temperature Danger Zone](#), the conditions under which food is preserved are not identical. Refrigerated foods are kept at 4°C or below, when the growth of many types of bacteria will be inhibited. Most foods can maintain their textures upon storage under refrigeration. However, some types of bacteria like *Listeria monocytogenes* can still thrive at refrigerated temperatures. It is worth noting that if present, it can proliferate in the refrigerator over time and lead to foodborne illness.

雪櫃溫度：攝氏4度或以下
Refrigeration Temperature: 4°C or below

	有殼蛋 Shell Eggs: 3-5 星期 Weeks		雞肉 Chicken: 1-2 日 Days
	魚類 Fish: (例如三文魚 e.g. salmon) 1-2 星期 Weeks		扒類 Chops: 3-5 日 Days
	貝類海產 Shellfish: 1-2 星期 Weeks		菜湯 / 肉湯 Vegetable / Meat-added Soup: 3-4 日 Days

圖1: 部分食物的冷凍保存期 (來源: 美國食物及藥物管理局 <https://www.fda.gov/media/74435/download>)
Figure 1: Storage period of some refrigerated food
(Source: Food and Drug Administration <https://www.fda.gov/media/74435/download>)

相反地，當食物貯存於攝氏零下18度或以下，細菌會被迫進入休眠狀態。與冷凍相比，由於微生物生長受到抑制，因此能減低食物變壞的情況。另外，把魚類等食物冷藏於攝氏零下20度或以下七天或攝氏零下35度或以下約20小時，能在食品製作環節中殺死寄生蟲。不過，有些食物經冷藏後可能會出現品質問題，包括冷藏肉類出現凍燒、朱古力上出現脂霜（白色或灰色的外層）及蛋黃醬有不穩定的油與水混合乳狀液（水和油層分離），因而不適合用來配製食物。在冷藏或冷凍食物前，應提前做好準備，檢查哪些食物可保持新鮮和有營養。

雪櫃內食物的種類及保質期

冷凍和冷藏廣泛用於貯存易變壞食物（包括肉類、海鮮及香腸等加工食物）。然而，並非所有食物都適宜存放在雪櫃內，例如香蕉等蔬果有可能受冷害（蔬果暴露於比最佳貯存溫度低的溫度而受損或品質變差）影響。冷害是一種會令食物品質下降及使保質期變短的現象。此外，有殼蛋不可以放進冰格。冷藏有殼蛋或會改變蛋類的蛋白質結構，可能使蛋殼爆裂。蛋類應存放在雪櫃內，不要冷藏。

有些人可能會以為冷凍和冷藏食物的保質期會大大延長，但請注意，保存期視乎食物的種類而會有所不同。食物經長時間冷凍貯存後仍可能變壞。新鮮禽畜等食物保存數天可以安全食用。值得注意的是，當預先包裝食物開封後，所述的建議食用日期便不能作準，應遵守生產商食品開封後貯存時間和貯存方式的指示。

妥為分開生熟食物和保持雪櫃清潔

把生的食物與即食食物及熟食分開，對防止交叉污染至關重要。食物放進雪櫃或冰格前，應放進有蓋或密封的容器內。把生的食物置於熟食或即食食物下方，以防其汁液滴下至熟食或即食食物上，引致交叉污染。若要貯存大量食物，最好有不同的冷存設備用以把生的食物與即食食物及熟食分別存放。此外，雪櫃應定期清潔。

注意事項

1. 冷凍及冷藏可保持食物處於低溫，從而保存食物，但保存的條件卻不同。
2. 冷凍及冷藏可用於貯存多種食物及延長保質期，但這些保存方法可能不適用於某些食物。
3. 冷凍或冷藏食物時，生的食物與即食食物及熟食應分開。
4. 應定期清潔雪櫃保鮮格及冰格。

給消費者的建議

- 在沒有溫度監察設備的雪櫃及冰格內放置專用的溫度計，並定時檢查溫度。
- 在雪櫃內貯存即食食物及熟食時，應遵從2小時 / 4小時原則。
- 雪櫃門應時常保持關閉。

給業界的建議

- 查看冷存工具的溫度記錄圖表，確保運作正常。
- 留有足夠容量貯存大批食材。
- 雪櫃應定期進行保養維修。

In contrast, bacteria are forced to enter a dormant stage when foods are stored at -18°C or below. When compared with refrigeration, food spoilage is minimised because microbiological development is inhibited. Besides, freezing food like fish at -20°C or below for seven days or at -35°C for about 20 hours can kill parasites in food manufacturing processes. However, some foods may face food quality issues upon freezing, which include [freezer burn](#) in frozen meats, fat bloom (whitish or greyish coating) on chocolates and unstable oil-in-water emulsions (discrete aqueous and oil layers) in mayonnaise, making them unsuitable for food preparation. Prior to freezing or refrigerating food, it is advisable to prepare ahead and inspect which items can be kept fresh and nutritious.

Food Types and Storage Periods in the Fridge

Refrigeration and freezing are widely adopted in storing perishable foods including meats, seafoods and processed foods like sausages. Nevertheless, not all food items are suitable to be kept in the fridge. Fruit and vegetable crops like banana may be susceptible to chilling injury (damage or deterioration which occurs when food is exposed to temperatures below their optimal storage temperature). Chilling injury is a physiological response that can shorten shelf life in addition to reducing product quality. In Besides, shell eggs should not be put into freezers. Freezing shell eggs may alter their egg protein structure and may cause the shells to crack. Eggs should be stored in the refrigerator rather than frozen.

While some may think that refrigerated and frozen foods have significantly longer shelf lives, it is important to remember that keeping times vary depending on the types of food. Refrigerated foods can still be spoiled after prolonged storage. Foods like fresh poultry could be kept for days for safe consumption. Of note, once the packaging of prepackaged food is opened, the date mark may become irrelevant. Follow the manufacturer's instructions for storage time and conditions after opening.

Keys for Keeping Foods Safe – Proper Separation and Sanitation

Separating raw foods from ready-to-eat (RTE) and cooked foods is essential to avoiding cross-contamination. Foods should be stored in covered or sealed containers before they are put into the fridge or freezer. Raw foods should be stored below RTE or cooked foods to prevent their juices from dripping onto other foods and hence causing cross-contamination. For large scale food storage, it is preferable to have different cold storage equipment for separating raw foods from RTE and cooked foods. Besides, fridges should be cleaned regularly.

Key Points to Note

1. Refrigeration and freezing preserve foods by keeping them cold but under different conditions.
2. While refrigeration and freezing can be used to store a wide range of foods and extend their shelf lives, these methods may not be suitable for preserving some food items.
3. When refrigerating or freezing foods, raw foods should be separated from RTE and cooked foods.
4. Clean the fridge compartments regularly.

Advice to the Public

- Keep appliance thermometers for refrigerators and freezers without temperature monitoring devices and check the readings regularly.
- Follow the [2-hour / 4-hour rule](#) for storing RTE and cooked foods into the fridge.
- Always keep the fridge doors closed.

Advice to the Trade

- Check the temperature log graphs of cold storage devices to make sure they function properly.
- Allow sufficient capacity for bulk storage of food stock.
- Maintain and service refrigerators regularly.

食物安全重點控制和ISO 22000是什麼，如何有助食物安全？

What are HACCP and ISO 22000 and How Can They Help Food Safety?

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,
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食物安全是公共衛生和食物業的重要範疇，對於預防食源性疾病和保障消費者起關鍵作用。“食物安全重點控制”(HACCP)和ISO 22000是兩個廣為人知的食物安全管理系統。本文將探討其功能、差異，及採用這些系統的好處和獲取認證的事宜。

Food safety is a critical aspect of public health and the food industry, pivotal for preventing foodborne illnesses and safeguarding consumers. The Hazard Analysis Critical Control Point (HACCP) and ISO 22000 are two well-known systems in food safety management. This article examines their functions, their differences, the benefits of adopting these systems and matters relating to obtaining certifications.

認識HACCP系統

Understanding HACCP

HACCP系統是用來確定及控制各種危害的系統性科學方法，而並非依賴製成品的測試。HACCP的起源可追溯至1960年代，是美國太空總署為確保太空食品的安全而研發的，現已演進成食物安全管理的軸心。HACCP系統以下列七項原則為本，指導食物業找出潛在危害和推行控制措施：

The HACCP system is a scientific and systematic approach to identifying and controlling food safety hazards instead of relying on end-product testing. Originated from NASA in the 1960s to ensure the safety of astronauts' food, HACCP has evolved into a crux of food safety management. The system is based on the following seven principles, which guide food businesses in identifying potential hazards and implementing control measures:

1. 進行危害分析並擬定控制措施；
2. 確定控制重點；
3. 訂定認可監控標準；
4. 制定監察程序；
5. 制定矯正程序；
6. 驗證HACCP計劃和制定確認程序；及
7. 設立存檔系統。

1. Conduct a hazard analysis and identify control measures;
2. Determine critical control points (CCPs);
3. Establish validated critical limits;
4. Establish monitoring procedures;
5. Establish corrective actions;
6. Validate the HACCP plan and establish verification procedures; and
7. Establish documentation.

HACCP涵蓋食物供應鏈中各個階段，由生產及加工到分發及食用。實施HACCP系統涉及一連串程序，過程由成立HACCP團隊、對產品及擬定的用途進行詳細描述、製作生產流程圖及到操作現場驗證其準確性開始。這些初步程序為實施七項基本原則奠定基礎。

HACCP covers all stages of the food supply chain, from production and processing to distribution and consumption. There are several steps involved in implementing HACCP. The process begins with forming an HACCP team, detailing the product and its intended use, creating a production process flow diagram, and verifying its accuracy on-site. These initial steps lay the groundwork for implementing the seven fundamental principles.

認識ISO 22000

ISO 22000是國際標準化組織最初於2005年制定的食物安全管理系統國際標準，共分為10個部分，之下有多項條款，涵蓋以下關鍵要素：



圖2: HACCP 的12個步驟
Figure 2: 12 steps of HACCP

Understanding ISO 22000

ISO 22000 is an international standard for food safety management systems crafted by the International Organization for Standardization (ISO) initially in 2005. The standard is structured

into 10 sections with numerous clauses encompassing the following key elements:

- 系統管理；
- 互動式溝通；
- 前提計劃如良好製造規範、良好衛生規範；及
- HACCP原則。

- System management,
- Interactive communication,
- Prerequisite programmes (PRPs) such as Good Manufacturing Practice, Good Hygiene Practices, and
- HACCP principles.

ISO 22000 適用於食物鏈中從農場到餐桌的任何業務，無關規模大小和複雜性。為協助企業把 ISO 22000 融合在其他管理系統內，ISO 22000:2018 (最新版本) 採用與其他ISO管理系統標準相同的高階結構。

ISO 22000 can be applied to any organisations in the food chain, from farm to fork, regardless of size and complexity. To facilitate integration of ISO 22000 with other management systems by enterprises, ISO 22000:2018 (the current edition) follows the same High Level Structure as other ISO management system standards.

HACCP 與ISO 22000的比較

Comparing HACCP and ISO 22000

自1993年以來，食品法典委員會已確認HACCP系統作為確保食物安全最具成本效益的方法。HACCP提倡以系統性和預防性的方法，應用七個原則，並通過文件和檔案記錄，突顯透明度和可追溯源頭的過程，以確保食物安全。

The Codex Alimentarius (Codex) has endorsed the HACCP system as the most cost-effective approach for ensuring the safety of food since 1993. HACCP advocates a systematic and preventive approach to ensure food safety by applying 7 principles which also emphasise transparent and traceable processes through documentation and record-keeping.

ISO 22000 已包含HACCP 原則，但會進一步延申至更宏觀的角度對待食物安全。雖然兩個系統均強調通過基本條件和行動在整個生產過程中減低危害(稱為前提方案)的重要性，但只有ISO 22000 羅列了前提方案的確實要求和遵循情況。此外，ISO 22000引進了管理原則的其他要素如以客為本、流程方法及持續改進，從而增強組織持續提供能滿足客戶的產品和服務，以及符合食品安全和監管要求的能力。

ISO 22000 encompasses the HACCP principles but extends further and takes a broader view on food safety. While both systems emphasise the importance of basic conditions and activities to minimise hazards throughout production (known as PRPs), only ISO 22000 has specific requirements concerning PRPs and their adherence. Furthermore, ISO 22000 integrates additional elements of management principles like customer focus, process approach and continual improvement, which enhance the ability of the organisations to consistently deliver products and services that meet customer as well as food safety and regulatory demands.

推行HACCP 或 ISO 22000並取得認證的好處

Benefits of Practicing HACCP or ISO 22000 and Obtaining Certifications

在本港，雖然推行HACCP是自願性的，但卻能帶來顯著的好處，包括提高食物安全及加強消費者保障。通過確定控制重點和採取預防措施，企業能提高食物安全水平，減低污染及食源性疾病的風險並確保符合所出口地區訂定的食物安全規例及標準。

In Hong Kong, although practicing HACCP is voluntary, it offers significant benefits including enhanced food safety and consumer protection. By identifying critical control points and implementing preventive measures, businesses can raise food safety standards, mitigate risks of contamination and foodborne illnesses, and ensure compliance with food safety regulations and standards established by regulatory authorities in export destinations.

HACCP和ISO 22000認證均可透過獲認可的認證機構進行視察核證取得。認證機構遍佈全球（包括香港在內），可瀏覽國際認證論壇來獲取認證機構的資訊。（<https://www.iafcertsearch.org/search/certification-bodies>）

獲取HACCP或ISO 22000認證展示對食物安全的承諾。獲取ISO認證更進一步展示機構遵循適用於食物安全的法例及監管要求，滿足雙方商定、與食品安全相關的客戶要求，因此能提高誠信度增加，加強業務的全球競爭力。全面實施ISO 22000並持有認證機構發出的有效ISO 22000證書的香港食物業處所可通過“持牌食物業處所採取的修訂巡查制度”申請認證。詳情請瀏覽[食物環境衛生署網頁](#)。

Both HACCP and ISO 22000 certifications are attainable through a successful audit conducted by a recognised certification body. Certification bodies exist worldwide, (including Hong Kong) and can be found on the International Accreditation Forum (IAF) website. (<https://www.iafcertsearch.org/search/certification-bodies>)

Certification under either HACCP or ISO 22000 demonstrates a commitment to food safety. Acquiring ISO certification further underscores compliance with applicable statutory and regulatory food safety requirements and meeting mutually agreed customer requirements related to food safety thereby bolstering credibility and enhancing competitiveness globally. In Hong Kong, food establishments that have fully implemented ISO 22000 and hold valid ISO 22000 certificates issued by accredited bodies can apply for recognition under the 'Revised Inspection Regime for Licensed Food Premises'. For further information, please visit the [FEHD website](#).

芒果發生樹脂道變色 Resin Canal Discolouration in Mangoes

芒果是夏季受歡迎的水果。當我們配製水果菜餚時，偶爾會在芒果上發現棕色或黑色的綫條。有些人或會擔心這些芒果的怪異外觀可能是水果變壞、受寄生蟲侵害或長得不健康的跡象。

芒果出現深色綫條是一種名為「樹脂道變色」的自然現象。芒果的果皮到果肉部分均可能發生樹脂道變色現象。這些綫條能作為一種對抗蟲害和病原體入侵的保護機制，也能調節芒果的成熟過程。

受樹脂道變色影響的芒果只要新鮮、沒有變壞，便仍可供人食用。業界和市民應向可靠的來源購買水果，並應[管理好貯存的食物](#)，以保持水果新鮮衛生，可供安全食用。



圖3: 樹脂道變色
Figure 3: Resin Canal Discolouration

Mangoes are popular fruits in summer. While we are preparing fruit dishes, sometimes brown or black discoloured lines may be found on mangoes. Some may be concerned that the strange appearance of these mangoes could be a sign of fruit spoilage, parasitic infestation or unhealthy growth.

The dark coloured lines found in mangoes are known as resin canal discolouration (RCD), which is a natural phenomenon. RCD can be formed from the fruit skin to the fleshy fruit portion of mangoes. They act as a protective mechanism against pest and pathogen invasion, and also regulate ripening of the fruit.

Mangoes affected by RCD are still fit for human consumption, provided that they are fresh and without spoilage. The trade and the public should obtain fruits from reliable sources, and should adopt [good stock management](#) to keep fruits fresh and wholesome for safe consumption.

夏日食物安全：保持食安，分外舒爽！ Summer Food Safety: Keep Your Food Safe and Stay Cool!

細菌能在溫暖的氣候滋長，因此在夏季需要特別注重食物安全。眾所周知，食源性疾病在炎熱潮濕的時期較為流行，因為這樣的環境會加速細菌生長。常見的食源性致病菌如沙門氏菌、副溶血性弧菌及金黃葡萄球菌在夏季月份繁殖得更快。

要保持食物安全，應遵循「[食物安全五要點](#)」，包括：

- 精明選擇：選擇安全的原材料；
- 保持清潔：保持雙手及用具清潔；
- 生熟分開：分開生熟食；
- 煮熟食物：徹底煮熟食物至中心溫度最少達攝氏75度；及
- 安全溫度：把熟食熱存在攝氏60°C以上，冷食冷存在攝氏4°C或以下。

處理熟食時，須遵從「[2小時/4小時原則](#)」。烹製好的食物如置於室溫，可於四小時內安全食用。烹製好不超過兩小時的食物，可貯存於雪櫃待用。熟食如置於室溫超過四小時，便須棄掉。這些原則對[學校午膳飯盒](#)同樣適用。

It is important to prioritise food safety especially during summer as bacteria thrive in warm temperatures. It is known that foodborne illnesses are more during hot and humid periods, as such condition increases bacterial growth. Common foodborne pathogens like *Salmonella*, *Vibrio parahaemolyticus* and *Staphylococcus aureus* grow more readily in the summer months.

To keep your food safe, practise the "[5 Keys to Food Safety](#)", which include:

- Choose – choose safe raw materials;
- Clean – keep your hands and utensils clean thoroughly;
- Separate – separate raw and cooked food;
- Cook – cook food thoroughly to a core temperature of at least 75°C; and
- Maintain a safe temperature – by keeping hot food at above 60°C and cold food at 4°C or below.

One should follow the "[2 hours/4 hours rule](#)" when handling cooked food. Cooked food kept at room temperature can be safely consumed within 4 hours of cooking. If the food is cooked within 2 hours, you can store it in a refrigerator for later use. Discard the food if it has stayed at room temperature for more than 4 hours. These rules also apply to [school lunch boxes](#).



風險傳達工作一覽（二零二四年八月）

Summary of Risk Communication Work (August 2024)

事故/ 食物安全個案 Incidents/ Food Safety Cases: 416	公眾查詢 Public Enquiries: 120	業界查詢 Trade Enquiries: 277	食物投訴 Food Complaints: 578	給業界的快速警報 Rapid Alerts to Trade: 3
給消費者的食物警報 Food Alerts to Consumers: 1	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: 20	上載到食物安全中心網頁的新訊息 New Messages Put on the CFS Website: 53	