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

二零二零年八月・第一百六十九期
August 2020•169th Issue
ISSN 2224-6908

由食物環境衞生署食物安全中心於每月第三個星期三出版
Published by the Centre for Food Safety, Food and Environmental Hygiene Department on every third Wednesday of the month

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編輯委員會 EDITORIAL BOARD

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含蛋三文治中的沙門氏菌引致食物中毒

Food Poisoning Caused by Salmonella in Sandwiches Containing Eggs

食物安全中心風險管理組 梁麗君醫生及蔡育嬌醫生報告

Reported by Dr. Queenie LEUNG and Dr. Lousia CHOI, Medical and Health Officers, Risk Management Section, Centre for Food Safety

二零二零年五月，食物環境衞生署食物安全中心(食安中心)調查一個品牌三文治所造成的大型食物中毒事故，當中涉及99宗個案，合共236人受影響。據衞生署衞生防護中心表示，患者在進食購自本港不同零售店的含蛋三文治後，出現腹痛、嘔吐、腹瀉及發燒徵狀，51人需要入院，其中一人更需要接受深切治療。在受影響人士當中，有37名的糞便樣本檢出對D組沙門氏菌呈陽性反應。在其中一個零售點所抽取的兩個含蛋三文治樣本中，亦檢出含有沙門氏菌。

涉事三文治由一所位於觀塘的本地食物製造工場生產，該工場向12個零售點供應三文治。在上述食物製造工場及零售點進行的實地調查發現，可能有多項因素造成這次食物中毒事故，這些因素包括：(1)在同一工作枱上處理生熟配料，導致交叉污染；(2)手部衞生設施不足，食物處理人員全日共用一條抹手毛巾，未有更換；(3)以沒有任何溫度控制設備的同一車輛運送包裝好的三文治，先是在上午送往九龍及新界西各區的零售點，然後在下午送往港島的零售點，導致三文治在運送過程中長時間置於不當的貯存溫度。有時未售出的三文治會再送往其他零售點以補充存貨，可能使運送時間進一步延長；以及(4)製成的產品貯存及標籤不當，調查發現有一個零售點的三文治存放在錄得溫度為攝氏19度至20.7度的雪櫃中，而三文治包裝上並無食用期限或生產日期供員工或顧客參考。

In May 2020, the Centre for Food Safety (CFS) of the Food and Environmental Hygiene Department investigated a large-scale food poisoning outbreak involving a brand of sandwiches, with a total of 99 clusters affecting 236 persons. According to the Centre for Health Protection of the Department of Health, the victims suffered from abdominal pain, vomiting, diarrhoea and fever after consumption of egg-containing sandwiches purchased from different retail shops in Hong Kong. Fifty-one of the victims required hospitalization, including one required intensive care. Stool specimens of 37 affected persons were tested positive for Group D *Salmonella*. Two egg-containing sandwich samples taken from a retail outlet were also found to contain *Salmonella*.

It was found that the sandwiches concerned were produced by a local food factory in Kwun Tong, which provided sandwiches to 12 retail outlets. Field investigation at the above food factory and retail outlets revealed a number of factors which may contribute to this food poisoning outbreak. These factors include: (1) Cross-contamination of cooked ingredients by raw ingredients as they were handled on the same working table; (2) Inadequate hand hygiene facilities as the same towel for hand drying was shared among food handlers throughout the whole day without replacement; (3) Prolonged exposure to improper holding temperature during delivery as packed sandwiches were delivered to retail outlets located in various districts in Kowloon and New Territories West in the morning round, and Hong Kong Island during the afternoon round using a single vehicle without any temperature control facilities. There were occasions when, unsold sandwiches were transported between retail outlets for replenishment of the stock, and this could further increase the delivery time; and (4) Improper storage and labelling of the finished products. During investigation, the sandwiches were found being stored at refrigerators recorded 19°C to 20.7°C in a retail outlet and no expiry date or production date was found on the package of the sandwiches for staff or customers' information.

If the sandwiches require delivering to retail outlets or storage, As a rule of thumb, keep food out of the temperature danger zone (i.e. between

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如三文治需要運送至零售點或要貯存，基本原則是在運送及貯存期間，食物應保持於危險溫度範圍(即攝氏4度至60度)外，以防微生物滋生。三文治如置於室溫超過4小時，便須棄掉。在配製食物時，食物處理人員應保持雙手衞生，並分開處理生熟食物，以免造成交叉污染。

在知悉事故及調查結果後，食安中心指示上述食物製造工場及各零售點即時停售所有涉事三文治。食安中心已向有關員工提供食物安全及衞生教育，並要求各有關處所進行徹底清潔及消毒。食安中心亦已發出新聞稿，呼籲市民不要食用涉事三文治。在採取防控措施後，再無發生其他個案。

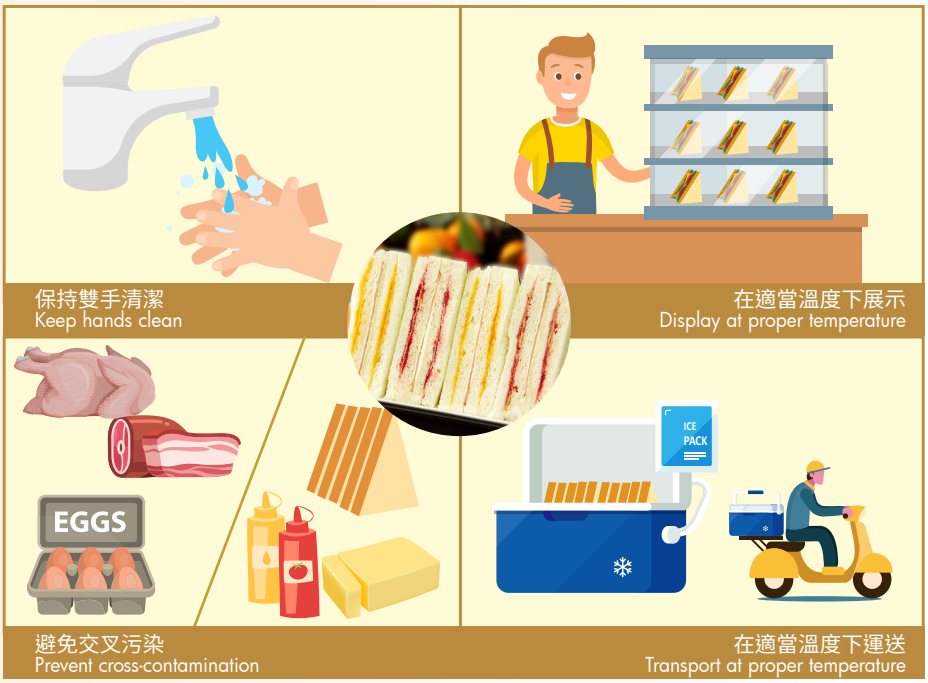

圖1：減少三文治造成食物中毒風險的措施
Figure 1: Measures to reduce the risk of food poisoning outbreaks caused by sandwiches

4°C and 60°C) to limit the growth of microorganisms during transport and storage if the sandwiches have been left at room temperature for more than four hours, they should be discarded. When preparing food, food handlers should observe proper hand hygiene and handle raw and cooked food separately to avoid cross-contamination.

Upon knowing the incident and investigation finding, the CFS instructed the food factory and retail outlets to stop sale of all the sandwiches concerned immediately. The CFS provided health education on food safety and hygiene to the staff, and requested them to carry out thorough cleaning and disinfection of the concerned food premises. The CFS has also issued press releases to urge the public not to consume the sandwiches concerned. No further cases occurred after preventive and control measures were implemented.

注意事項

1. 沙門氏菌可引致嚴重疾病，是常見導致食物中毒的微生物。
2. 三文治在配製過程中通常都是以人手直接處理，故屬高風險食物。如被食物處理人員或其他生或未煮熟的配料污染、長時間貯存不當，都可能會增加食物中毒的風險。
3. 為了防止發生食物中毒事故，食物處理人員應遵從「食物安全五要點」。

給消費者的建議

- 只光顧可靠的持牌食肆。
- 三文治購買或配製後(包括在家自製的三文治)如非即時進食，應存放於攝氏4度或以下的雪櫃內。

給業界的建議

- 預先計劃生產時間及流程，避免過量或過早配製食物。
- 在貯存及運送時，確保食物及配料置於適當溫度。
- 食物製造工場經營者應提供適當的洗手設施(例如梘液、抹手紙)、清潔的工作間及分開製作生熟食物的區域。

Key Points to Note

1. *Salmonella* can cause severe illness and is a common food poisoning microorganism.
2. Sandwiches are considered a high risk food, as sandwich preparation often involves manual handling. Contamination by food handlers or other raw or undercooked ingredients, prolonged and improper storage may increase the risk of food poisoning.
3. To prevent food poisoning outbreaks, food handlers should adhere to Five Keys to Food Safety.

Advice to Consumers

- Patronise only reliable and licensed food premises.
- If sandwiches are not to be consumed immediately after purchase or preparation (including home-made ones), they should be kept in the refrigerator at or below 4°C.

Advice to the Trade

- Plan the production schedule and process ahead to avoid over-production or prepare the food way too in advance.
- During storage and transport, keep food and ingredients at proper temperature.
- Operators of food factories should provide proper hand washing facilities (e.g. liquid soap, paper towels) and clean workplace with separated areas for preparation of raw and cooked food.

食物安全平台
Food Safety Platform

揭示潛藏的心臟敵人 -「部分氫化油」

Unveil Partially Hydrogenated Oils (PHOs) - the Hidden Heart Attacker

食物安全中心風險評估組
科學主任林伏波博士報告

Reported by Dr. Violette LIN, Scientific Officer,
Risk Assessment Section, Centre for Food Safety

你知道「部分氫化油」可能隱藏在許多加工食品中嗎？舉例來說，「部分氫化油」可以在用來炸薯片的油、製作酥皮及鬆脆餅乾的人造牛油/植物起酥油當中找到。「部分氫化油」是工業生產的反式脂肪的主要來源，世界衞生組織(世衞)期望在全球食品供應鏈中停用工業生產的反式脂肪。本文旨在揭示「部分氫化油」如何成為有損心臟健康的潛藏敵人，必須加以阻截。

「部分氫化油」是從油轉變為脂肪作特定產品用途的工業產品

「部分氫化油」在20世紀初首次引入食品供應中，以取代成本較高的油脂，包括飽和脂肪酸含量高的動物油脂(例如牛油、豬油、牛脂)以及植物脂肪(例如可可脂)。油脂經過「氫化」的工業過程，改變成為種類繁多的「部分氫化油」產品，以切合食品生產所需用途。透過控制過程中的各項元素(例如油的種類、氫氣壓力、溫度、催化劑等)，液體狀的油經氫化後轉變為在室溫下呈半固體或固體狀的脂肪(圖1)。

在氫化過程中，順式不飽和脂肪酸的雙鍵有部分轉變為飽和脂肪酸，部分則轉為反式不飽和脂肪酸(即反式脂肪酸)。不完全氫化(即若干不飽和脂肪酸存留在油中)會產生液體、半固體或固體狀的部分氫化油，而完全氫化(即所有脂肪酸都已飽和)則會產生在室溫下呈蠟質脂肪狀的完全氫化油。在氫化過程中形成的反式脂肪酸可提高氫化油的熔點、延長保質期及提升味道穩定性。

很多食品的生產都採用了各式各樣呈半固體至固體狀的「部分氫化油」，例如各式不同軟硬度的人造牛油、質感結實或鬆軟的餅乾及蛋糕等烘焙食品。「部分氫化油」還有助於做出層次豐富的酥皮及批皮，令曲奇餅及薯片口感鬆脆。至於油炸冬甩，固體狀的「部分氫化油」可使之添上光澤，並防止液體狀的油轉移至糖衣及/或包裝。

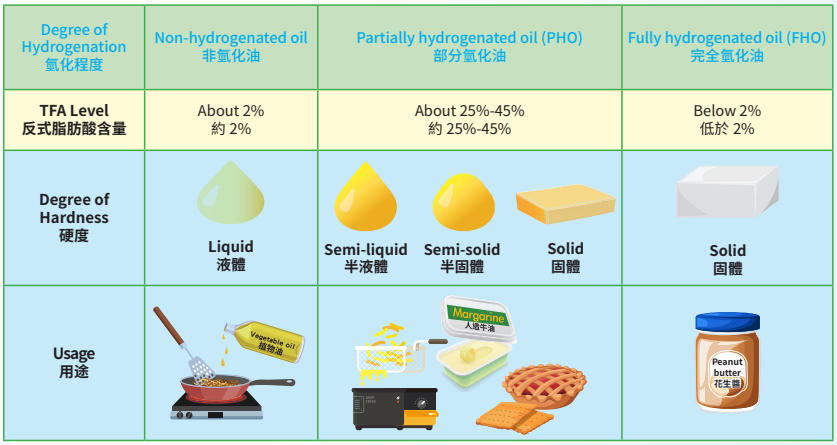

圖1：液體狀的油經過不同程度的氫化(由部分至完全)，改變成為不同硬度(由液體至固體)的脂肪作各種用途。在氫化過程中，工業生產的反式脂肪可能會在「部分氫化油」之中大量形成，含量通常介乎25%至45%。

Figure 1: Modification of liquid oils at different degrees of hydrogenation (from partial to complete) produces fats of different hardness (from liquid to solid) for various applications. During hydrogenation, high levels of IP-TFAs may result in PHOs, typically at between 25% and 45%.

禁止使用「部分氫化油」的主因在於其含有大量工業生產的反式脂肪

「部分氫化油」由於價格較天然的動物及植物脂肪低，並可延長產品的保質期，故為食品工業所廣泛採用。「部分氫化油」亦曾被認為是較健康的選擇，可代替因飽和脂肪酸含量高而會增加膽固醇水平及心血管病發病率的動物及植物脂肪。數十年後的今天，越來越多的科學研究證明，經「部分氫化油」攝取的工業生產的反式脂肪會損害健康，並大大提高罹患冠心病的風險。

工業生產的反式脂肪不單使低密度脂蛋白「壞」膽固醇增加，亦同時減少高密度脂蛋白「好」膽固醇。根據世衞建議，工業生產的反式脂肪並非健康飲食的一部分，故要加以避免。為了保障消費者的心臟健康，美國、加拿大及新加坡等國家已相繼禁止在食品中使用「部分氫化油」，而歐洲聯盟成員國則已就食品中工業生產的反式脂肪含量設定限值。

Do you know that partially hydrogenated oils (PHOs) could be hidden in many processed foods? To name a few, PHOs can be found in oils for deep frying crispy chips, margarine/vegetable shortening for making puff pastries and biscuits flaky. PHOs are the primary source of industrially-produced trans fatty acids (IP-TFAs) which the World Health Organization (WHO) aims to eliminate from the global food chain. This article is an effort to explain a thing or two about PHOs, a hidden attacker which should be kept at bay for your heart health.

PHOs are industrially produced for turning oils into fats for specific product applications

PHOs were first introduced into food supply in the early 20th century as an economical replacement for oils and fats with a high content of saturated fatty acids (SFAs) in animal (e.g. butter, lard, beef tallow) and vegetable (e.g. cocoa butter) fats. A vast range of PHO products has been developed through an industrial process of "hydrogenation" which modifies oils and fats tailored to suit the desired applications in food production. By controlling the various elements in the process (such as the types of oil, hydrogen pressures, temperatures, catalysts, etc.), a liquid oil is turned into semi-solid or solid fat at room temperature through this hydrogenation process (Figure 2).

During the process of hydrogenation, double bonds in *cis* unsaturated fatty acids are converted partly into SFAs and partly into trans unsaturated fatty acids (i.e. TFAs). Incomplete hydrogenation (i.e. some unsaturated fatty acids remain in the oil) produces a liquid, semi-solid or solid PHO, whereas complete hydrogenation (all fatty acids are saturated) produces a waxy fat, fully hydrogenated oil (FHO) at room temperature. The TFAs formed during the hydrogenation process increase the melting point, shelf life and flavour stability of the hydrogenated oil.

The versatile semi-solid to solid PHOs have been used in producing many foods. For instance, they give different forms of margarine from soft to hard in texture, and of compact or airy baked goods such as biscuits and cakes. PHOs also help create layers in puff pastries and pies. They give cookies and potato chips a crispy mouthfeel. For deep-frying of doughnuts, solid PHOs can give glaze and prevent migration of liquid oil into coatings and/or packages.

The crux of banning PHOs is their high IP-TFA levels

The use of PHOs in food industries has become popular because of their low prices comparing with those of natural animal and vegetable fats and the longer life span of their products. PHOs were also once believed to be a healthier alternative for animal and vegetable fats high in SFAs, which would increase cholesterol levels and the incidence of cardiovascular disease. And now, decades later, there are growing evidence from scientific research that consumption of IP-TFAs from PHOs is harmful to health and contributes significantly to increased risk of coronary heart disease.

IP-TFAs not only increase the low-density lipoprotein (LDL) "bad" cholesterol, but also decrease the high-density lipoprotein (HDL) "good" cholesterol. The WHO suggests that IP-TFAs are not part of a healthy diet and have to be avoided. To protect the heart health of consumers, countries like the USA,

減少從飲食攝取「部分氫化油」以保護心臟健康

要限制飲食中工業生產的反式脂肪含量，有賴業界與消費者的共同努力。「部分氫化油」是完全可以取代的。業界應考慮選擇較為有益健康的油脂，盡可能採用含有較少飽和脂肪酸及較多不飽和脂肪酸的油脂，來改良食品配方。飽和脂肪酸只應作有限度用途，並且只限於沒有其他選擇的情況。至於人造牛油及植物起酥油，應採購不含「部分氫化油」的。

消費者應保持均衡及多元化的飲食，多吃各種蔬果，少吃高脂食物。烹調時參考健康飲食金字塔，盡量少用油脂。無論何時，盡可能選擇較健康的食物。最後也同樣重要的是，善用營養標籤選購飽和脂肪酸含量較低及不含反式脂肪酸的預先包裝食品。

Canada and Singapore have banned the use of PHOs in foods, whereas the member states of the European Union have set IP-TFA limits in foods.

Reduce PHO intakes from our diets for our heart health

In limiting IP-TFAs in our diet, a concerted effort is needed from traders and consumers. PHOs are totally replaceable. In replacing PHOs, traders should consider using options of healthier oils and fats that contain as little SFAs and as much unsaturated fatty acids as possible when reformulating food products. SFA should only be used in limited applications where there is no alternatives. For margarine and vegetable shortening, source for PHO-free ones.

Consumers should maintain a balanced and varied diet comprising a wide variety of fruits and vegetables rather than high fat foods. When cooking, use oils and fats sparingly with reference to the food pyramid. Always choose the healthier ones whenever possible. Last but not least, use the nutrition label to choose prepackaged food lower in SFAs and no TFAs.

食物事故點滴
Food Incident Highlight

正確使用即棄手套處理食物的重要性
Importance of Proper Use of Disposable Gloves in Food Handling

因應本港目前2019冠狀病毒病疫情的發展，越來越多食肆員工選擇在工作時使用即棄手套，令人關注即棄手套是否使用得當。值得注意的是，手套若不正確使用，其實同樣不衞生，亦可增加交叉污染的機會，因為雙手不論有沒有戴上手套，都可沾染細菌，而且還會令食物處理人員有安全的錯覺，誤以為不會受到感染。

如要戴上即棄手套處理即食食物，應使用清潔的手套以防止污染。在戴上手套前及除下手套後，應妥為清洗雙手。此外，手套應經常更換，例如在轉換工作崗位及工序時，或當手套弄污時。供單次使用的手套不應重用。切記佩戴即棄手套並不能代替洗手。盡可能安排專責員工負責處理食物，而其他一般員工則處理付款或廢物及進行清潔等職務，以進一步加強食物安全。

In view of the current development of the COVID-19 pandemic in Hong Kong, more and more restaurant employees choose to use disposable gloves at work. There are concerns whether disposable gloves are being used properly. Of note, improper use of gloves not only equals unhygienic hands and increases the chance of cross-contamination as gloved hands can also take up bacteria like bare hands, but also gives food handlers a sense of false security against infections.

When wearing disposable gloves in handling ready-to-eat food, clean ones should be used to prevent contamination. One should wash hands properly before wearing and after removing gloves. Furthermore, gloves should be changed frequently, e.g. between different jobs and processes or when they are soiled. Gloves intended for single use should not be reused. Do remember that wearing disposable gloves cannot replace hand washing. Where possible, designated staff could be arranged for handling food, while other general staff could share duties such as handling payment or waste and carrying out cleaning work to further strengthen food safety.

牛肝菌與食物安全
Boletes and Food Safety

七月份本地發生一宗懷疑因進食預先包裝牛肝菌而引致食物中毒的個案。調查結果顯示，從有關零售店所收集的牛肝菌樣本摻雜了有毒菇類。涉事零售商已被要求停售及回收受影響的產品。

牛肝菌品種甚多，有可食用的，但也有具毒性的。在採摘野生菇類時，有可能把其他具毒性的菇類摻雜在可食用的牛肝菌中。因食用有毒菇類而導致食物中毒的事件時有報道。中毒徵狀在進食不久後便會出現，例如腸胃不適，而情況嚴重者更可能會昏迷及肝臟受損。

市民如懷疑菇類產品摻雜了不明品種，不應食用；如懷疑因進食菇類而中毒，應立即求醫。業界應向可靠的供應商採購牛肝菌，並妥為備存存貨記錄。

In July, there was a food poisoning case suspected to be caused by the consumption of prepackaged boletes. Investigation revealed that the bolete samples collected from the retail outlet were mixed with poisonous mushrooms. The retailer was asked to stop sale and to recall the affected products.

There are many species of boletes. Some are edible but some are poisonous. Mixing edible boletes with other poisonous mushrooms is possible during harvesting from the wild. Food poisonings due to consumption of poisonous mushrooms were reported from time to time. Symptoms like gastrointestinal discomfort could appear shortly after ingestion. In severe cases, it may result in coma and liver damage.

The public should not consume mushroom products which are doubted to be mixed with unknown species, and should seek medical attention immediately if mushroom poisoning is suspected. The trade should source boletes from reliable suppliers and keep proper inventory records.

風險傳達工作一覽（二零二零年七月）
Summary of Risk Communication Work (July 2020)

事故／食物安全個案 Incidents/ Food Safety Cases: 145	公眾查詢 Public Enquiries: 111	業界查詢 Trade Enquiries: 166	食物投訴 Food Complaints: 361	給業界的快速警報 Rapid Alerts to Trade: 6
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: 22	上載到食物安全中心網頁的新訊息 New Messages Put on the CFS Website: 68	