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食物安全中心
風險評估組
科學主任馬嘉明女士報告

Reported by Ms. Janny MA, Scientific Officer,
Risk Assessment Section,
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最近，食物安全中心(中心)在保發食品有限公司製造的一個冷熏三文魚樣本中驗出小量李斯特菌。本文將探討冷熏三文魚含李斯特菌的風險和在生產過程中採取有效控制措施的重要性。

Recently, the Centre for Food Safety (CFS) found that a cold-smoked salmon sample from Polyfood Food Service Co Ltd contained a small amount of *Listeria monocytogenes*. This article discusses the risk of *L. monocytogenes* in cold-smoked salmon and the importance of effective control during the production.

煙三文魚中的李斯特菌

煙三文魚可以熱熏或冷熏方法熏製。熱熏是把三文魚在大約攝氏70至80度下熏熟。冷熏是在不高於攝氏33度的溫度熏製，使三文魚不被熏熟或令蛋白凝固。和熱熏不同，冷熏只能減少李斯特菌的數目，但一般不足以把該菌完全殺滅。李斯特菌是一種在環境中無處不在的細菌，生的三文魚亦可能帶有少量李斯特菌。

L. monocytogenes in Smoked Salmon

Smoked salmon can be prepared by hot-smoking or cold-smoking. In hot-smoking, salmon is smoked at around 70-80°C to cook the flesh. However, in cold-smoking, salmon is smoked at no higher than 33°C to avoid cooking the flesh or coagulating the protein. Therefore unlike hot-smoking, cold-smoking is generally insufficient to eliminate but only reduce the level of *L. monocytogenes*, a bacterium which is ubiquitous in the environment and may also be present in raw salmon at low levels.

此外，三文魚在冷熏後須經過切片等多重處理，如果沒有依足優良衛生規範，產品很容易受李斯特菌交叉污染。

In addition, the extensive handling of salmon, for example slicing followed by cold-smoking, also provides ample opportunities for *L. monocytogenes* to cross-contaminate the products if inadequate attention is given to the Good Hygienic Practices (GHPs).

由於即食冷熏三文魚可讓李斯特菌在其較長的冷藏保質期間慢慢繁殖，因此，即使是受少量李斯特菌污染，亦特別值得關注。



冷熏三文魚
Cold-smoked salmon

世界各地曾發生多宗冷熏三文魚因受李斯特菌污染而須回收的事件，亦有間接的流行病證據顯示受污染的煙熏魚類與人類患李斯特菌病有關。

Ready-to-eat cold-smoked salmon may allow *L. monocytogenes* to grow slowly throughout its relatively long refrigerated shelf-life. Its contamination with *L. monocytogenes*, even with small quantities, is therefore of particular concern.

Various food recalls due to *L. monocytogenes* contamination in cold-smoked salmon have been reported all over the world.

There is also indirect epidemiological evidence associating contaminated smoked fish and human listeriosis cases.

有效的控制措施對確保食物安全的重要性

一般而言，食物含少量李斯特菌(例如每克食物含少於100個菌落形成單位)對消費者的健康影響極微。但如細菌數量增加，消費者可能有染上李斯特菌病的風險。大部分身體健康的人在感染李

Importance of Effective Control to Ensure Food Safety

In general, foods containing low levels of *L. monocytogenes* (e.g. <100 colony-forming unit (cfu)/g) pose very little risk to consumers. However, as the number of bacteria increases, consumers will be at risk of listeriosis. Even most healthy individuals do not develop symptoms or only have mild symptoms when infected, severe complications such

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焦點個案
Incident in Focus

斯特菌後不會出現病徵或只出現輕微病徵，但如受感染的是長者、幼兒和免疫力較低等**高危人士**，則可能出現嚴重的併發症如敗血症及腦膜炎，甚至死亡。**孕婦染上李斯特菌病**更可導致流產、胎死腹中、早產或新生嬰兒受感染。因此，在冷熏三文魚的製作過程中，最重要的是預防李斯特菌污染及控制其生長。

首先，來貨中的李斯特菌可通過監控原材料的品質來控制。更重要的是，加工廠的設備和用具須妥為安排，減少受李斯特菌污染的可能性。舉例來說，由凝水（俗稱「倒汗水」）產生的液滴和噴霧有機會直接或間接污染食物及接觸食物的表面，因此有必要保持良好的通風，以減少凝水的形成。此外，專門的清潔及消毒措施，以及環境監察制度對於控制李斯特菌亦是非常重要的。製作和處理冷熏三文魚的員工亦應接受關於預防污染的培訓。

由於食物存放在不適當的溫度下有利於李斯特菌的繁殖，製成品的溫度控制（不應超過攝氏6度，以攝氏2至4度為宜）至為重要。把冷熏三文魚保持冷凝，或改良食物配方。

中心採取的行動

中心在驗出有冷熏三文魚樣本含李斯特菌後，已指令涉事生產商全面回收其生產的所有品牌及批次的煙三文魚產品，並停止有關生產線的運作，以進行徹底清洗消毒。

食物環境衛生署（食環署）會密切跟進事件。有關生產商須採取令食環署滿意的補救措施（包括李斯特菌防控措施），才能恢復生產。

注意要點：

- 李斯特菌在冷藏溫度下仍可緩慢生長。
- 冷熏三文魚屬容易受李斯特菌污染的高危食物。
- 預防李斯特菌污染及控制其生長對確保冷熏三文魚的安全至為重要。

給市民的建議

1. 高危人士應避免進食保質期較長的冷凍即食食物（例如包括三文魚在內的冷熏海產、軟芝士和切片凍肉等）。
2. 嚴格遵從標籤上的指示存放煙三文魚。
3. 切勿進食已過了“此日期或之前食用”日期的煙三文魚。

給業界的建議

1. 在加工處理食物時遵守優良衛生規範，確保食物不會危害市民健康。
2. 食物製造業應採用「食物安全重點控制」（HACCP）系統以防止出現食物安全問題。
3. 如對某種即食食品是否有利李斯特菌生長存疑，應徵詢專業意見，亦可參閱食品法典委員會制定的《應用食品衛生的一般原則控制食品中單核細胞增生李斯特氏菌的準則》（CAC/GL 61-2007）。

as septicaemia, meningitis or even death may occur in the **susceptible populations**, including the elderly, young children, and people with weakened immunity. **Listeriosis during pregnancy** can lead to miscarriage, stillbirth, premature delivery, or infection in newborns. Prevention of *L. monocytogenes* contamination and controlling its growth is of prime importance in cold-smoked salmon production.

Firstly, raw material control could play a role on the incidence of *L. monocytogenes* in incoming fish. More importantly, equipment and facilities in the production plant should be properly laid out to reduce the potential for *L. monocytogenes* contamination. For instance, droplets and aerosols from condensates can directly or indirectly contaminate food and food contact surfaces, it is essential to control the ventilation to minimise condensate formation. Furthermore, specified cleaning and disinfection programmes, along with an environmental monitoring programme are also critical to assuring *L. monocytogenes* control. Employees involved with the production and handling of cold-smoked salmon should also be trained to prevent cross-contamination.

Since temperature abuse would foster the growth of *L. monocytogenes*, strict temperature control for finished product i.e. never exceed 6°C (preferably 2-4°C) is also vital. Growth of *L. monocytogenes* in cold-smoked salmon can also be controlled by freezing or product reformulation.

Actions Taken

Subsequent to the detection of *L. monocytogenes* in the concerned cold-smoked salmon by the CFS, the manufacturer was instructed to recall all smoked salmon produced, regardless of the brand and batches, and suspend the relevant production line to carry out thorough cleaning and disinfection.

The Food and Environmental Hygiene Department (FEHD) will closely follow up the incident. The manufacturer should demonstrate that the remedial actions have been taken and are up to the satisfaction of the FEHD including measures addressing *L. monocytogenes* risk before resuming operation.

Key Points to Note:

- *L. monocytogenes* can grow slowly at refrigeration temperatures.
- Cold-smoked salmon is regarded as a high-risk food of *L. monocytogenes* contamination.
- Prevention of *L. monocytogenes* contamination and controlling its growth is important to ensure the safety of cold-smoked salmon.

Advice to the Public

1. Susceptible populations should avoid consuming ready-to-eat foods with long shelf-lives under refrigeration (e.g. cold-smoked seafood including salmon, **soft cheeses** and deli meat).
2. Store smoked salmon strictly in accordance with the instructions on the labels.
3. Avoid consuming smoked salmon beyond its “use by” date.

Advice to the Trade

1. Observe GHPs in food processing to assure that the food products do not pose risk to the public.
2. Food businesses are recommended to implement the Hazard Analysis and Critical Control Points (HACCP) system to prevent food safety problems.
3. Seek professional advice from food scientists if there is any doubt on whether individual food product can support the growth of *L. monocytogenes*. Reference can also be made to the **Codex Guidelines on the Application on General Principles of Food Hygiene to the Control of *Listeria monocytogenes* in Foods (CAC/GL 61-2007)**.

甜味劑在減少糖攝取量方面的角色 (上篇)

Role of Sweeteners in Reduction of Sugar Intake (Part I)

食物安全中心
風險評估組
科學主任郭麗儀女士報告

Reported by Ms. Joey KWOK, Scientific Officer,
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我們對甜味的熱愛橫跨年齡，種族和文化。但是，過量攝取糖分卻對健康有不良影響。本文將討論甜味劑，特別是低熱量甜味劑在取代部分膳食中添加的糖中所擔當的角色及其對體重控制的影響。

世界衛生組織對糖攝取量的指引

二零一五年三月，世界衛生組織(世衛)就成人及兒童的糖攝取量發出指引，強烈建議終身減少游離糖攝取量，以及將成人和兒童的游離糖攝取量降至能量總攝入量的10%以下。游離糖指所有由製造商、廚師和消費者在食物添加的單糖和雙糖，以及蜜糖、糖漿、果汁及濃縮果汁中天然含有的糖。世衛又建議將游離糖攝取量進一步減至每日能量總攝入量的5%以內，認為在減少齲齒方面，可帶來額外的健康好處。

如在日常生活中落實世衛以上的建議，以每日從膳食攝入2000千卡能量的人為例，游離糖的每日攝取量分別為50克(強烈建議)和25克(條件性建議)。有人可能會想，如果遵從這些限制糖攝取量的建議，以後還能繼續吃甜的食物和飲料嗎？

低熱量甜味劑的特性

阿斯巴甜(aspartame)、三氯半乳糖糖(sucralose)和紐甜(neotame)等低熱量甜味劑只有極低甚至不含熱量。這些甜味劑又稱為高甜度甜味劑，甜度遠高於砂糖(即蔗糖)數十至數千倍不等。在食物中只須加極小量的甜味劑便能達致所需甜度，因而可大幅減少食物所含的熱量。

如果想享用甜食，但又不想攝取糖分或熱量，低熱量甜味劑的確是一個好選擇。用於食物的低熱量甜味劑的安全性已得到國際食物安全機構的肯定，可安全納入成為多元化和均衡飲食的一部分，這也是世界各地食物安全機構的一致看法。關於甜味劑食物安全問題的更多論述，可參閱過往期數的《食物安全焦點》。

低熱量甜味劑與體重控制

世衛指出，整體證據顯示，增加或減少攝入游離糖，體重亦會有相對應的改變。無論攝入的游離糖分量是多少，這種關係依然存在。進食過多游離糖會造成能量過剩，以致過重。那是否意味着，只要用低熱量甜味劑取代游離糖，就能控制體重呢？

大家可能聽過早年有研究指低熱量甜味劑會刺激食慾，令人吃得更多，反而令體重增加。我們留意到現在多了一些近期的研究結果。短期隨機對照試驗結果一致顯示，以低熱量甜味劑取代糖所減少的熱量有助在短期內達到減輕體重的效果。而這些研

Our desire for sweet taste extends across different ages, races and cultures. This article discusses the role of sweeteners, in particular low-calorie sweeteners, in replacing some of the added sugar in our diet, and its implications for weight control.

World Health Organization's Guideline on Sugar Intake

In March 2015, the World Health Organization (WHO) released the *Guideline: Sugars Intake for Adult and Children*, in which a reduced intake of free sugars throughout the lifecourse as well as reducing intake of free sugars to less than 10% of total energy intake in both adults and children was strongly recommended. Free sugars include monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates. WHO also suggests that a further reduction of free sugars intake to below 5% of total energy intake would provide additional health benefits in the form of reduced dental caries.

Translating the above-mentioned WHO's recommendations into daily practice, for a total energy intake of 2000 kcal a day, the daily "allowance" for free sugars would be 50 g (strong recommendation) and 25 g (conditional recommendation), respectively. With these recommendations in mind, some may wonder whether we are still going to be able to enjoy sweet-tasting food and beverages without exceeding the recommended sugar intake limits.

The Nature of Low-calorie Sweeteners

Low-calorie sweeteners (e.g. aspartame, sucralose and neotame) have very little or no caloric values. They are also known as intense sweeteners because they are substantially sweeter, ranging from several dozen to several thousand times sweeter than table sugar (i.e. sucrose), and thus only a tiny amount is needed to give the food enough sweetness, resulting in substantial calorie-savings.

Indeed, low-calorie sweeteners offer a feasible alternative to enjoy sweet-tasting food and beverages without the added sugar or calories. The safety of low-calorie sweeteners that are suitable for food use has been evaluated by international food safety authorities, and thus these sweeteners can be safely incorporated as part of a varied and balanced diet. Food safety authorities worldwide share the same view. Further information on the food safety of sweeteners can be found from previous issues of *Food Safety Focus*.

Low-calorie Sweeteners and Weight Control

According to WHO, the totality of evidence reviewed indicates that increasing or decreasing free sugars is associated with parallel changes in body weight, and the relationship is present regardless of the level of intake of free sugars. The excess body weight associated with free sugars intake results from excess energy intake. This brings to the next question: is it possible to achieve weight control simply by replacing free sugars with low-calorie sweeteners?

Some of us may be aware that some earlier studies had brought about the hypotheses that low-calorie sweeteners might stimulate appetite or increase food intake, and in turn cause people to gain weight. Nowadays, more recent research findings have become available. Evidence from short-term randomised control trials consistently indicates that when low-calorie sweeteners are used to replace sugar, the resulting reduction in calories can help to achieve short-term weight loss. Recent studies have not observed that low-calorie sweeteners promote overeating. Nevertheless, there is insufficient



各種含有甜味劑的食物和飲料
Various forms of food and beverages containing sweetener

究並沒有得出低熱量甜味劑會令人吃得過多的結論。不過，目前並沒有足夠證據顯示低熱量甜味劑與長期的體重控制之間存在關係。

事實上，保持體重的關鍵在於避免攝取多於身體所需的熱量。以低熱量甜味劑取代砂糖的確可以減少熱量，但如果因為省下了熱量而在之後吃得更多，或吃了更多其他產生熱量的營養素，例如碳水化合物、蛋白質和脂肪等，對於減輕體重仍然是徒勞無功的。長期維持健康的體重需要保持積極健康的生活模式，包括均衡飲食和適當運動，而且持之以恆。

下期我們會探討人類對甜味的反應和人們對在兒童食物中使用甜味劑的關注。

evidence at present to conclude the relationship between the use of low-calorie sweeteners and long-term weight control.

Indeed, the key to maintaining body weight is not to consume more calories than are burnt. Low-calorie sweeteners can be used as an alternative to save calories by replacing table sugar. Nevertheless, they only work if the calorie saving is not added back, say by eating more food as a reward later in the day, or by taking in more of other calorie-yielding nutrients such as other types of carbohydrates, protein and fat in the overall diet. Achieving long-term weight maintenance rests on a healthy and active lifestyle that includes a sensible, balanced diet and regular physical activity, and this requires long-term commitment.

In the next article, we will look into how the human beings respond to sweet taste, and the concerns on the use of sweeteners among children.

食物事故點滴
Food Incident Highlight

鹹魚含敵敵畏

食物安全中心(中心)上月透過恆常的食物監察計劃，發現兩個散裝鹹魚(馬友)樣本含有除害劑敵敵畏殘餘。中心已封存同批次產品的餘貨，涉事商戶其後已安排將該批餘貨銷毀。

鹹魚在曬乾的過程中容易受蟲害，有些商戶可能因而在製作過程中使用除害劑。雖然有食物規管當局就魚或水產中的某些除害劑殘餘制定最高限量，但其中不包括敵敵畏。鹹魚含敵敵畏等同於濫用除害劑。不過，按兩個樣本驗出的除害劑含量，在一般食用情況下，不會對健康造成不良影響。

中心呼籲業界採購食物時應光顧可靠的供應商，並確保食物適宜食用及符合法例要求。中心亦建議市民保持均衡飲食，以減少食物風險；並少吃鹹魚，減少鈉的攝入量。

Dichlorvos in Salted Fish

Last month, the Centre for Food Safety (CFS), under its regular Food Surveillance Programme, found pesticide residues dichlorvos in two samples of loose-pack salted fish (thread fin). The CFS marked and sealed the remaining stock of the affected batch of the product; subsequently the traders concerned had it disposed of.

It is known that the process of sun-drying salted fish is prone to insect infestation and some traders may use pesticides during processing. Although a few food regulatory authorities have set maximum levels for certain pesticide residues in fish or aquatic products, none has been set for dichlorvos. Presence of dichlorvos in salted fish is regarded as abusive. Nevertheless, based on its levels detected in the two samples, adverse health effects are unlikely after usual consumption.

The CFS reminds the food trade to source food from reliable suppliers, and to ensure that their food is fit for consumption and meets legal requirements. The CFS also advises the public to maintain a balanced diet to minimise food risk, and limit the consumption of salted fish to reduce sodium intake.

甲型肝炎與漿果類產品

三月中，有傳聞指本港一宗甲型肝炎感染個案與進食受污染的藍莓有關。傳言始於澳洲發生懷疑與某牌子在內地加工的冷凍雜莓有關的甲型肝炎個案。食物安全中心(中心)經調查後證實受影響產品並未進口香港，在本港市面上沒有發售。

食品法典委員會及各國食物安全規管當局都認為恆常在食物內檢測病毒的作用有限。但是，為了平息公眾對食用漿果類產品的疑慮，中心破例從本港市面上抽取冷凍漿果進行甲型肝炎病毒基因測試，所有化驗結果呈陰性反應。漿果一般為生吃，如漿果受甲型肝炎病毒污染，吃了會有感染病毒的風險。市民在進食水果前應以飲用水清洗。不過，值得注意的是，清潔水果並不能完全消除食物中的甲型肝炎病毒，控制新鮮農產品的甲型肝炎病毒風險的關鍵仍在於預防污染。

Hepatitis A and Berry Products

In mid-March, there were words circulating among the public that a local case of hepatitis A infection was suspected to be associated with the consumption of tainted blueberries. The speculation came after an outbreak of hepatitis A in Australia that has been linked to a brand of frozen mixed berries processed in Mainland China. Investigations by the Centre for Food Safety (CFS) found that the affected product was not imported into Hong Kong and was not available in the local market.

The Codex Alimentarius Commission and food safety regulatory authorities across the world have adopted the view that routine testing for viruses in food is of limited use. To address public concern over the safety of berry products, as an exceptional measure, the CFS has collected frozen berries from the local market for testing of genetic materials of hepatitis A virus (HAV) and all results are negative. Berries, which are usually eaten raw, may pose a risk of hepatitis A infection if they are contaminated. In general, members of the public are advised to wash fruits with potable water before consumption. However, it is worth noting that HAV on fruits cannot be completely eliminated by washing, control of HAV in fresh produce should focus on prevention of contamination.

風險傳達
工作一覽
Summary of Risk Communication Work

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