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## 焦點個案

### Incident in Focus

## 乳酪(芝士)製品中的李斯特菌

## *Listeria monocytogenes* in Cheese Products

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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二零一四年四月十八日,美國疾病預防及控制中心公布一宗李斯特菌爆發的最後調查結果。事件中有八人染病,包括兩名母親和她們的初生嬰兒以及一名初生嬰兒,其中一人死亡。調查結果,包括從食物(新鮮乳酪凝塊, fresh cheese curd)和環境樣本中驗出李斯特菌,顯示Roos Foods的乳酪製品很可能是肇事元兇。本文將探討各種乳酪製品含李斯特菌的風險。

### 乳酪

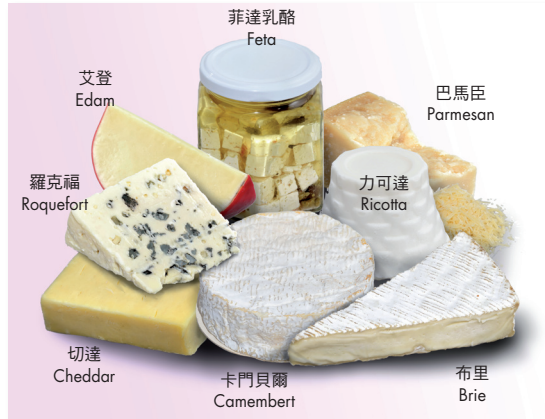
乳酪一般是把酪蛋白凝固後再去除部分乳清而成。當今世界各地已有超過500種乳酪,按照不同的製造過程,例如奶的種類、凝固方法、發酵劑、添加鹽分和成熟期等差異,便可做出不同品種。

事實上,乳酪的分類方法各有不同,但傳統上一般按乳酪的水分含量來分類-

軟乳酪 - 水分含量較高,例如菲達、布里、卡門貝爾
半硬乳酪 - 水分含量介乎軟乳酪和硬乳酪之間,例如艾登、豪達
硬乳酪 - 水分含量較低,例如切達、艾民頓
特硬乳酪 - 乾身、微脆、可磨,例如巴馬臣

乳酪亦可按其成熟程度來分類-

未成熟/新鮮乳酪 - 製成後即可食用,例如茅屋乳酪、力可達
成熟乳酪 - 不是準備在製成後短時間內食用,須在特定溫度和其他條件下存放若干時間,以使乳酪的生化和外觀變化下達致所需的特徵。這類乳酪包括-
• 霉菌催熟的乳酪 - 加入特定霉菌,當霉菌繁殖時,乳酪也會隨之成熟
- 霉菌長在內部:羅克福爾青霉菌( <i>Penicillium roquefortii</i> )在乳酪內部生長,令乳酪通體布有藍綠色的紋路(藍紋乳酪),例如丹麥藍乳酪、羅克福、英國斯蒂爾頓
- 霉菌長在表面:特色是卡門貝爾青霉菌在乳酪表面繁殖,例如布里、卡門貝爾
• 鹽水乳酪 - 沒有外皮,浸泡於鹽水中保存,例如菲達乳酪



本港市面上有不同種類的乳酪  
Various types of cheeses are available on the local market

On 18 April 2014, the US Centers for Disease Control and Prevention (CDC) announced its final investigation on a listeriosis outbreak which involved eight persons, including two mother-newborn pairs and a newborn, with one death in the US. Results of the investigation, with food (fresh cheese curd) and environmental samples tested positive for *Listeria monocytogenes*, indicated that cheese products made by Roos Foods were the likely source of the outbreak. This article discusses the risk of *L. monocytogenes* in cheese products.

### Cheeses

Cheeses can generally be obtained by coagulating the protein of milk and by partially draining the whey resulting from the coagulation. Nowadays, over 500 types of cheeses are available worldwide, with variations deriving from different cheese manufacturing processes, e.g. type of milk, coagulation method, starting culture, addition of salt and ripening etc.

In fact, there are various ways to categorise cheeses. Traditionally, cheeses have been classified principally by their moisture content-

Soft cheese - Has a higher moisture content, e.g. Feta, Brie, Camembert
Semi-hard cheese - Moisture content sits between soft and hard cheeses, e.g. Edam, Gouda
Hard cheese - Has a lower moisture content, e.g. Cheddar, Emmental
Extra hard cheese - Dry, slightly brittle, suitable for grating, e.g. Parmesan

Cheeses may also be grouped according to their principal ripening-

Unripened/ Fresh cheese - Ready for consumption soon after manufacture, e.g. Cottage cheese, Ricotta
Ripened cheese - Not ready for consumption shortly after manufacture; must be held for such time, temperature and other conditions that results in the necessary biochemical and physical changes characterising the cheese, including-
• Mould ripened cheese - ripening has been accomplished primarily by the development of characteristic mould growth
- Internal mould ripened: characterised by the growth of <i>Penicillium roquefortii</i> resulting a network of blue and green veins throughout the cheese (blue cheese), e.g. Danish blue, Roquefort, Stilton
- Surface mould ripened: characterised by the growth of <i>Penicillium camemberti</i> on the cheese surface, e.g. Brie, Camembert
• Cheese in brine - has no actual rind and preserved in brine, e.g. Feta

焦點個案  
Incident in Focus

## 乳酪中的李斯特菌

由乳酪，特別是軟乳酪而引致的李斯特菌病爆發在世界各地均有發生。食源性李斯特菌病由李斯特菌引致，是一種較罕見但嚴重的疾病。雖然正常的煮食溫度可消滅李斯特菌，但這種細菌在低至零度的冷藏溫度下仍可緩慢地生長。大部分健康良好的人感染李斯特菌後可能不會出現任何病徵，但李斯特菌對孕婦、長者和免疫系統受損(例如愛滋病患者和糖尿病患者)等高危人士可構成嚴重健康風險。

乳酪中的李斯特菌可能來自原材料，尤其是生乳；也可能來自加工廠環境，包括設備和人員；又或是製成品和原材料間的交叉污染。如溫度和其他條件，特別是酸度和濕度相宜，而且長時間存放，李斯特菌便有充裕的時間大量繁殖。

### 風險高低各不同

巴士德消毒把生乳加熱至某個溫度並保持一段時間，可有效消滅李斯特菌，因此用經巴士德消毒的奶類製成的乳酪除非在後期加工時受到污染，否則一般風險較低。

至於用未經巴士德消毒奶類製成的乳酪，其安全程度取決於影響李斯特菌等致病微生物的存在、繁殖、存活及失去活性的各種因素。

一般而言，用未經巴士德消毒的奶類製成的軟乳酪含有李斯特菌的風險較用未經巴士德消毒的奶類製成的硬／特硬乳酪為高，原因是前者酸度較弱、水分較多，有利於李斯特菌生長。澳洲新西蘭食品標準管理局在最近一份風險評估報告中亦指出，估計一般人因進食某些用生乳製成的軟乳酪(菲達和卡門貝爾)而感染李斯特菌的風險屬低，但高危人士的風險卻屬高。不過，一般人及高危人士因進食用生乳製成的切達乳酪(一種硬乳酪)和特硬乳酪而感染李斯特菌的風險分別是微乎其微及低／極低。

#### 注意要點：

1. 由乳酪，特別是軟乳酪而引致的李斯特菌病爆發在世界各地均有發生。
2. 用經巴士德消毒的奶類製成的乳酪一般風險較低。
3. 用未經巴士德消毒的奶類製成的軟乳酪風險最高。

### 給高危人士的建議

- 食用乳酪前細閱食物標籤，小心選擇。
  - 硬乳酪和特硬乳酪一般是安全的。
  - 避免吃軟乳酪(例如菲達、布里、卡門貝爾)和藍紋乳酪(例如丹麥藍乳酪、古岡左拉(Gorgonzola)和羅克福)。
- 至於其他種類的乳酪，只選吃那些用經巴士德消毒奶類製成的。
  - 如不能確定，切勿食用。
  - 嚴格遵從標籤上的指示存放乳酪製品。

### 給業界的建議

- 保持良好的食物和個人衛生，避免交叉污染。
- 在食物標籤上提供詳細資料，讓消費者知所選擇。
  - 在乳酪製品的標籤上標明是由生／未經巴士德消毒的奶類還是經巴士德消毒的奶類製成的。
  - 考慮在標籤上提供更多資料，例如乳酪製品的軟硬度。

## Listeria monocytogenes in Cheeses

Cheeses, particularly soft cheeses, have been implicated in listeriosis outbreaks worldwide. Foodborne listeriosis is a relatively uncommon but serious disease caused by *L. monocytogenes*, a pathogen that can be killed under normal cooking temperature but is able to grow slowly at refrigerated temperature as low as 0°C. Asymptomatic infection of listeriosis probably occurs in most healthy people, but it can pose serious health risks for the susceptible population including pregnant women, elderly and immunocompromised individuals such as patients with AIDS and diabetes mellitus.

The presence of *L. monocytogenes* in cheeses may be originated from the ingredients particularly raw milk or can come from the processing plant environment, including the equipment, personnel or cross-contamination between finished products and raw materials. If the temperature as well as other conditions especially acidity and water content permit, *L. monocytogenes* can grow to high levels upon prolonged storage.

### Cheeses of Higher or Lower Risk

Since pasteurisation, by heating milk to a specific temperature for a set period of time, kills *L. monocytogenes* effectively, cheeses made with pasteurised milk are generally considered of lower risk unless post-process contamination occurs.

For cheeses made with unpasteurised milk, their safety relies on a range of factors that influence the presence, growth, survival and inactivation of pathogenic microorganisms including *L. monocytogenes*.

In general, soft cheeses made with unpasteurised milk are of much higher *L. monocytogenes* risk than hard/ extra hard cheeses made with unpasteurised milk as the formers are likely to be less acidic and contain more moisture, which provide a favourable environment for the growth of *L. monocytogenes*, than the latter. A recent risk assessment study conducted by Food Standards Australia New Zealand also pointed out that the estimated *L. monocytogenes* risk from the consumption of certain raw milk soft cheeses i.e. feta and camembert is low in the general population but is high in the susceptible population. However, the *L. monocytogenes* risk upon the consumption of raw milk cheddar cheese (a type of hard cheese) and extra hard cheese in the general and susceptible populations is negligible and low/ very low respectively.

#### Key Points to Note:

1. Cheeses, particularly soft cheeses, have been implicated in outbreaks of listeriosis worldwide.
2. Cheeses made with pasteurised milk are generally considered of lower risk.
3. Soft cheeses made from unpasteurised milk are the most risky.

### Advice to Susceptible Populations

- Read food labels and choose cheeses carefully before consumption.
  - Hard and extra hard cheeses are generally safe.
  - Avoid soft cheeses (e.g. Feta, Brie, Camembert) and blue cheeses (e.g. Danish blue, Gorgonzola and Roquefort).
- For other types of cheeses, choose only those made from pasteurised milk.
  - Do not eat if in doubt.
  - Store cheese products strictly in accordance with the instructions on the labels.

### Advice to the Trade

- Maintain good food and personal hygiene and avoid cross-contamination.
- Provide sufficient information on food label for the consumers to make informed food choices.
  - Properly label whether the cheese products are made from raw/ unpasteurised or pasteurised milk.
  - Consider providing more information e.g. description on firmness of the cheese products.



## 慢煮與食物安全

# Slow Cooking and Food Safety

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,  
Centre for Food Safety

這是烹調方法與食物安全系列的最後一篇，我們會探討一下真空低溫烹調法(sous vide)和慢煮鍋這兩種慢煮法，看看慢煮是否真的出美味。

### 真空低溫烹調法

Sous vide的法文原意是真空。作為烹飪術語，這是指把食物放入塑膠袋並且真空密封，然後以精確的溫度（通常為攝氏47度至88度之間；一般是將整袋食物放入水浴鍋中以控制溫度）長時間烹煮。

真空低溫烹調法聽起來非常時尚，但其實這種烹調方法在法國和其他地方已有數十年的歷史。在香港，真空低溫烹調的食物不僅是餐廳的專利，在家也能做得到。

把食物真空密封後烹煮，可令水中的熱力快速傳至食物，並減少食物在貯存期間受到交叉污染的風險，從而延長食物的保質期。因此這種烹調方法可用於配製作零售及用於餐飲服務的食物。真空低溫烹調法能配製出傳統烹調法不能達致的食品品質，例如真空低溫烹調法能抑制在食物氧化過程中產生的異味，以及減少在烹煮時水分和味道揮發物的蒸發流失，令食物保存原汁原味。此外，精確的溫度控制令烹調過程容易成功複製(更易掌握食物的生熟程度)，而且能令肉質較韌的部位變得軟嫩。

然而，真空低溫烹煮的食物卻有微生物安全的隱憂。首先，

雖然沒有氧氣的環境不利於造成食物腐敗的細菌生長，但食物存放在攝氏4度至60度的危險溫度範圍過久，容易滋生產氣莢膜梭狀芽孢桿菌等致病菌。產氣莢膜梭狀芽孢桿菌的孢子耐熱，能在正常煮食過程中存活，如果溫度控制欠妥，可在真空包裝的食物中萌發繁殖起來。其次，真空低溫烹煮的食物長時間存放在雪櫃中，缺氧和冷藏的環境有利於李斯特菌等兼性厭氧菌(在有氧或無氧環境中均能生長繁殖的細菌)和肉毒桿菌等厭氧菌(在無氧條件下生長的細菌)的繁殖。最後，有些真空低溫烹調法的食譜，尤其是魚的食譜做法未能把食物徹底煮熟，不足以消滅食物中的致病菌或寄生蟲。

為確保食物安全，我們建議用真空低溫烹調法烹製的食物中心溫度應達至少攝氏75度30秒，或相當的溫度／時間組合，例如攝氏65度10分鐘；70度2分鐘，但食物的中心溫度不應少於攝氏60度45分鐘。

食物處理人員應留意，真空低溫烹煮的食物如果沒有徹底煮熟，會增加食物安全風險，對高危人士尤其危險。食物處理人員應採取措施，包括選用新鮮的優質食材，例如從可靠的供應商處購買刺身級的魚類，以改善有關食品的安全。但無論如何，高危人士應避免進食未經徹底煮熟的食物。

此外，只應選用製造商認證可用於煮食的食品級塑膠袋作真空低溫烹調之用。

### 慢煮鍋

慢煮鍋是一款用作低溫烹煮食物數小時的電器。

In this last article of cooking methods and food safety series, let's take a look at two ways of slow cooking i.e. via sous vide (pronounced "soo-veed") and using a slow cooker to see if soft fire really makes sweet malt.

### Sous vide

Sous vide is a French term meaning "under vacuum". As a culinary term, it refers to a method of cooking under vacuum in sealed plastic pouches at exact temperatures (generally in the range of 47°C - 88°C; often done in a water bath to control the temperatures) for a relatively long period of time.

Sous vide sounds like a new cooking method but it has decades of history in France and other international marketplaces. In Hong Kong, sous vide food is not only available at food premises but can also be prepared at home.

The vacuum sealing of sous vide food allows heat to be efficiently transferred from water to the food and increases the shelf life of food by eliminating possible cross-contamination during storage. Sous vide foods are therefore suitable for retail sale or use in food service. Sous vide can also be used to prepare food with qualities that cannot be achieved by traditional cooking methods e.g. it inhibits off-flavours from oxidation and prevents evaporative losses of flavour volatiles and moisture during cooking. The precise temperature control also allows almost-perfect reproducibility (greater control over doneness) and makes tough cuts of meat tender.

Nevertheless, there are concerns over the microbiological safety of sous vide foods. Firstly, even the oxygen reduced environment suppresses the growth of spoilage bacteria, food held at temperature danger zone

(4°C - 60°C) for prolonged period of time could allow pathogens like *Clostridium perfringens* spores which survive during normal cooking can germinate and grow in vacuum packed food if the temperature control is inadequate. Secondly, for sous vide foods stored under refrigeration for extended periods, the anaerobic (absence of oxygen) and refrigerated conditions provide an opportunity for the growth of certain facultative anaerobes (bacteria which can grow either with or without oxygen) e.g. *Listeria monocytogenes* and anaerobes (bacteria which require the absence of oxygen) e.g. *Clostridium botulinum*. Last but not least, some sous vide recipes, especially for fish, result in food that remains undercooked that any pathogenic bacteria or parasites are likely to survive.

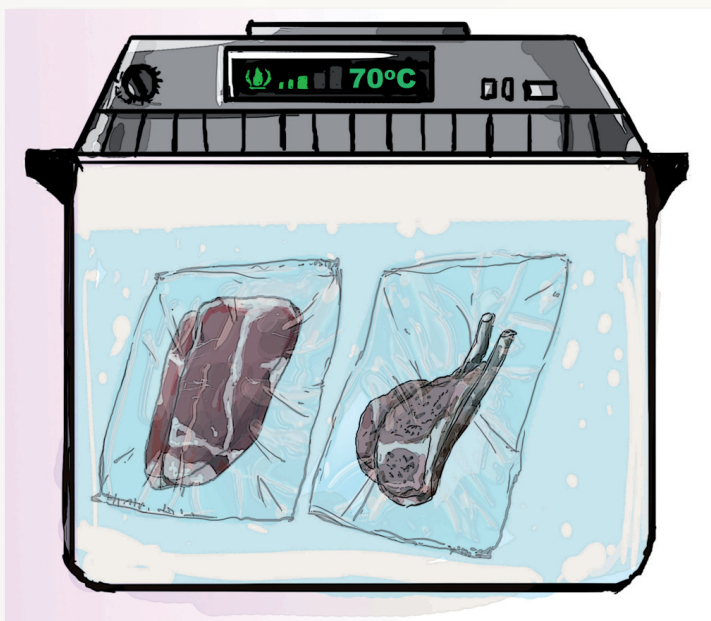
To ensure food safety, it is recommended that the core temperature of sous vide food should reach at least 75°C for 30 seconds or equivalent temperature/time combination e.g. 65°C for 10 minutes; 70°C for 2 minutes; while the core temperature of food should not be less than 60°C for 45 minutes.

Food handlers should be aware that sous vide food that remains undercooked presents an increased food safety risk especially for the susceptible populations. Measures should be taken including using high quality fresh ingredients e.g. sashimi grade fish from reliable sources to improve their safety. High risk population should however avoid consuming undercooked food.

In addition, food grade plastic bags, certified as suitable for cooking by the manufacturer, should only be used for sous vide cooking.

### Slow Cooker

Slow cooker is an electrical appliance which is designed to cook food at lower temperatures for several hours.



真空低溫烹調法  
Sous vide cooking

從微生物的角度去看，正確使用慢煮鍋來烹煮食物是安全的，因為從鍋裡直接傳至食物的熱力和長時間的烹煮，都能消滅食物中的微生物。

然而，過去曾發生因慢煮鍋溫度不足，以致未能破壞豆中的植物血球凝集素而發生的食物中毒事件。多種豆類都含有植物血球凝集素這種天然毒素，其中以紅腰豆的含量最高。因此，如果想用慢煮鍋烹煮豆類，尤其是紅腰豆，便要先行把豆浸透，並以沸水高溫徹底烹煮。不然的話，罐頭豆也是一個好的選擇。

From the microbiological point of view, cooking food by using a slow cooker properly is safe as the direct heat from the pot, prolonged cooking etc. added to destroy microorganisms that may be present in the food.

Nevertheless, there had been food poisoning outbreaks associated with slow cooked beans as the cooking temperature was not high enough to destroy phytohaemagglutinin. This natural toxin is found in many bean species, among them the highest concentration is found in red kidney beans. So if one really wants to cook beans especially red kidney beans in a slow cooker, the beans should be soaked in water and cooked thoroughly at boiling temperature beforehand, or canned beans should be used instead.

食物事故點滴  
Food Incident Highlight

意大利杏仁曲奇含有玻璃碎片

二零一四年四月十七日，食物安全中心發出食物警報，提醒市民一款從意大利進口的杏仁曲奇可能含有玻璃碎片，呼籲市民切勿食用。中心已指令進口商停止供應受影響批次的產品。為審慎起見，該進口商主動回收該款杏仁曲奇的所有批次。

預先包裝食物有時會在食物加工過程中意外摻雜了異物。食物中混有玻璃碎片可能是因為包裝時有玻璃破裂，或玻璃容器本身有瑕疵。進食這些含有玻璃碎片的食物可能會被割傷。

為盡量減低玻璃等異物進入食物的機會，食物製造商應奉行優良製造規範，小心處理生產設備和原料，以及設立妥善的監管制度，以確保所製造的食物可供安全食用。

Glass Fragments in Italian Almond Pastry



受影響的意大利杏仁曲奇  
The affected Italian almond pastry consumption.

On 17 April 2014, the Centre for Food Safety issued a food alert to urge the public not to consume a kind of almond pastry imported from Italy since the product might contain glass fragments. The importer was instructed to stop supply of the affected batch of the product. As a prudent measure, the importer initiated a recall of the product regardless of batches.

From time to time, pre-packaged food products have been found with foreign matters which may have accidentally entered food in any part of the food processing chain. Glass fragments may have entered food as a consequence of glass breakages during packaging or through defective glassware. Food contaminated with glass may cause cuts and physical harm when ingested.

Food manufacturers should adopt good manufacturing practice in order to minimise the chance of glass and other foreign matters entering food. They should exercise care in handling equipment and raw materials, and set up sound monitoring systems to ensure that the food produced is safe for

韓國進口杏仁餅乾含未有標示致敏物 (花生)

二零一四年四月二十五日，食物安全中心(中心)發出食物致敏物警報，提醒市民一款韓國製造的杏仁餅乾可能含有花生，但沒有在標籤上註明，建議對花生過敏的消費者停止食用。

花生是常見的致敏物。對花生過敏的人士進食含有花生的食物後，可能會出現臉部、舌頭或嘴唇腫脹、氣喘和皮膚痕癢等過敏反應，嚴重的甚至可引起過敏性休克(一種急性且可能致命的過敏反應)。在香港，所有預先包裝食物如含有花生等八種指明的致敏物，必須在標籤上註明。

中心已通知有關代理商及商戶，並已知會業界停止出售該產品。對花生有過敏反應的市民應立即停止食用有關產品。如食用上述產品後出現過敏反應，應盡快求醫。

Undeclared Allergen (Peanut) in Almond Cracker Imported from Korea



受影響的韓國杏仁餅乾  
The affected Korean almond cracker

On 25 April 2014, the Centre for Food Safety (CFS) issued a food allergen alert to advise consumers allergic to peanut to stop consuming a kind of prepackaged almond cracker manufactured in Korea since the product might contain peanut which has not been listed on the food label.

Peanut is a common food allergen which can cause allergic reactions in sensitive individuals. People who are allergic to peanut may develop symptoms and signs like swelling of face, tongue or lips, shortness of breath and itchiness upon consumption. Anaphylactic shock (an acute, severe and potentially life-threatening allergic reaction) may even develop in severe cases. In Hong Kong, all prepackaged food is required to indicate the presence of eight specified allergens, including peanut.

The CFS has informed the concerned distributor and retail shops, and alerted the trade to stop selling the product concerned. Consumers who are sensitive to peanut should stop eating the affected product and seek medical treatment if allergic symptoms develop after taking the food.

風險傳達  
工作一覽  
Summary of  
Risk Communication Work

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