食物安全平台
Food Safety Platform

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

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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。

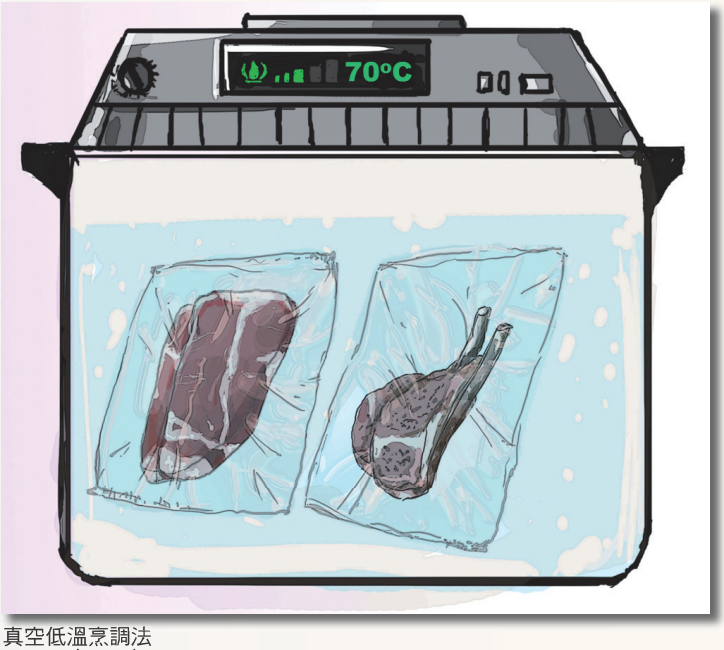
真空低溫烹調法

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物品質，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。



真空低溫烹調法
Sous vide cooking

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 to grow. The heat resistant *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.

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，該入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碎裂，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。

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

Glass Fragments in Italian Almond Pastry

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 consumption.

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。

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

Undeclared Allergen (Peanut) in Almond Cracker Imported from Korea

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

風險傳達工作一覽（二零一四年四月） Summary of Risk Communication Work (April 2014)	數目 Number
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