

食物安全焦點

Food Safety Focus

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一旦核事故發生時有關食物安全的應變措施 Food Safety Responses in case of a Nuclear Event

食物安全中心
風險評估組
科學主任周淑敏女士報告

Reported by Ms. Shuk-man CHOW, Scientific Officer,
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雖然位於鄰近深圳的大亞灣核電站發生站外緊急情況的機會微乎其微，香港特別行政區政府已審慎地作好應急準備，制定了一套全面的大亞灣應變計劃，以處理可能出現的有關情況。該計劃詳列所有有關政府部門的應變工作，並可將按既定機制啟動。本文將會簡介一旦發生會影響遠離現場地區的核事件時有關食物安全的應變措施。

Although the chance of off-site emergency is remote at Daya Bay Power Station, which locates in neighbouring Shenzhen, the HKSAR Government is prudent to have established a comprehensive Daya Bay Contingency Plan (DBCP) to address any potential possibilities of such an event as emergency preparedness. The DBCP encompasses responses from all involved government departments and will be activated in response to defined mechanisms. In this article, we introduce the food safety responses in case of a nuclear incident affecting the areas far away from the site.

核事故期間的食物安全問題

只有發生極其罕見核事件的情況下，民用核設施(如核電站)才會有機會意外把放射性物質外泄至四周環境。當發生這種洩漏事故時，由源頭洩漏出的放射性物質會按當時風向於大氣中擴散。擴散過程受距離、風速、雨量、外泄的放射性物質濃度等多項因素影響。放射性物質會沉積在受影響地區，沉積量會隨距離和時間而減少。戶外動植物的表層可能因而會受到污染。當放射性物質飄到農業區，便會被農作物、禽畜和水產吸收及／或攝入，過量輻射可能會進入食物鏈內。

大亞灣應變計劃中有關飲食防護措施旨在確保所有食物和農產品可供人安全食用，即不會對市民健康造成急性影響，並盡量減低市民因進食可能含有少量輻射污染食品對健康造成的長期影響。

事實上，天然輻射經常存在於四周環境中。人體新陳代謝過程通常會自行修復由低水平輻照可能造成的損害。在發生核事件後，放射性超出規管水平的所有食物及農產品均不會在本港市面上出售。屆時有關當局將會提供建議，確保市民可採取適當的食物處理方法，例如去除食品外皮或外葉、徹底沖洗和容許食物有時間自然

Food Safety Issues in a Nuclear Event

In the unlikely event of nuclear incident, there would be a chance of accidental discharge of radioactive materials to the environment from civil (e.g. nuclear power stations) nuclear operations. Where such releases occur, radioactive materials released from the source disperse into the atmosphere along the direction of the prevailing winds. The dispersion will be influenced by factors like distance, wind speed, rainfall, concentration of radioactivity in the release, etc. The radioactive substances will deposit on affected areas with the amount of deposition decreases with distance and time. Plants and animals in the open fields may carry surface contaminations. When absorbed and/or taken up by crops, livestock and marine organisms, the enhanced radioactivity may enter the food chain.

The objective of the Ingestion Pathway Countermeasures of the DBCP is to ensure that all food and produce are safe for human consumption. This means that the acute health effects will be totally averted and long term health effects in the population arising from consumption of foodstuff that might contain low level of radioactive contamination will be minimised.

As a matter of fact, naturally occurring radioactivity is common in the environment. Our body metabolic processes can often repair any potential damage caused by low levels of radiation exposures. After a nuclear incident, any food and produce with radioactivity level exceeding the food control level will not be available for sale in the local market. Advice will be given to the public to ensure that any possible residual radioactive contamination will be further reduced by suitable food preparation, such as removal

焦點個案
Incident in Focus

發生放射性衰變以減低放射性，進一步減低食物中可能殘留的輻射污染。因此，市民不會因進食市面上供應的食品而對健康造成急性影響。

of the skin or outer layer of foodstuff, thorough washing and time delay to allow for decrease in radioactivity by natural radioactive decay. Acute health effect after consumption of foodstuffs on the market is therefore unlikely.



文錦渡食品管制辦事處
Man Kam To Food Control Office



監察食物中的放射性
Monitoring radioactivity in food

食物安全監控工作

食物安全中心(中心)一直推行日常監察計劃，以監察食物中的放射性。至今全部結果均合格。

一旦發生影響站外其他地區的輻射外泄事故，在核電廠方圓50公里內出產的食物均會經過內地有關當局的監察，然後才輸往香港。此外，中心亦會加強監察內地進口和本港生產的食物。所有不合格的食物不得輸入本港或供出售，並會進行妥善處置。

Food Safety Control

The Centre for Food Safety (CFS) has been conducting a routine surveillance programme to monitor the radioactivity in food. The results have always been satisfactory.

In the event of an accident leading to release of radioactivity affecting off-site locations, food produced within 50 km radius of the Power Plant will be monitored by Mainland authorities before exporting to Hong Kong. The CFS will also step up the monitoring of both imported and locally produced food. Those with unsatisfactory results will not be allowed for import or for sale and will be properly disposed.

注意要點

1. 進食受輻射污染的食物對人體健康造成的影響與輻射劑量有關。
2. 為保障公眾健康，中心一向設有日常監察計劃，以監察食物中的放射性。
3. 政府已制定大亞灣應變計劃，訂明大亞灣核電站一旦發生核事故時須採取的應變措施。

Key Points to Note

1. Health effects resulted from the consumption of radioactively contaminated food are dose dependent.
2. To safeguard public health, routine surveillance programme is in place to monitor radioactivity in food.
3. The Government has established the DBCP for responding to nuclear emergencies in relation to the Daya Bay Power Station.

給市民的建議

一旦發生核事故時，市民應密切留意政府透過傳媒作出的公布和建議。

Advice to Public

The public should pay close attention to government announcements and advice through mass media in case of a nuclear emergency.

抗氧化劑的魔力

The Magic of Antioxidants

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

我們都必須靠空氣中的氧氣生存。你又是否知道氧氣還會使食物變味、變色甚至變質呢？空氣中的氧氣與食物發生化學反應，稱之為氧化作用，此作用對大部分食品有不良影響。本文將會介紹抗氧化劑的魔力，讓大家了解這類食物添加劑如何防止食物氧化。

技術的層面

在食物業中，防腐劑及抗氧化劑都是常用添加劑，以防止食物變壞，延長食物保質期。防腐劑主要抑制微生物，而抗氧化劑則是用作對抗氧化作用。食物成分中的脂肪及油類、維他命和氨基酸最常受氧化作用的影響。

脂肪及油(特別是不飽和類)，以及含有這些成分的食物最常出現氧化問題。當脂肪與氧氣產生化學反應及分解，會產生不良味道和氣味，令食物出現酸敗。酸敗食物未必會引致食物中毒，但卻會發出異味和變得難吃，可能令你不想吃。因此，有些食物生產商會在脂肪和油含量高的食物中使用抗氧化劑，以求延緩出現或減慢氧化作用引起的酸敗過程。大家只要看一看薯片的標籤，就會發現上面列有抗氧化劑的名稱或識別編號及其技術用途(即抗氧化劑)！

食物中的維他命及氨基酸也容易受氧化作用破壞，以致食物可能變色和營養流失，因此業界亦會使用抗氧化劑來保存維他命豐富的食物，例如經加工的蔬果。此外，水產業會在蝦等水產中使用抗氧化劑，防止牠們因氨基酸的氧化作用而出現黑點。

常見的抗氧化劑

正如其他食物添加劑一樣，抗氧化劑可分為天然和人工合成兩類。抗壞血酸(維他命C)屬於天然抗氧化劑，經常用於食物中。大家想親眼看看它的魔力嗎？你只需在一片蘋果上加上數滴檸檬汁，檸檬汁中的維他命C就會令蘋果停止褐化！維他命C及其相關物質通常會添加在果汁、果醬和香腸等食物中，以抑制氧化作用。

由於人工抗氧化劑效果較佳和成本較低，食物生產商亦會在食物中使用一種或混合使用多種人工抗氧化劑。常見的種類包括沒食子酸鹽、經丁化作用的羥基茴香醚及經丁化作用的羥基甲苯。肉批、沙律醬或其他脂肪或油含量高的食物都可能含有一種或以上上述的抗氧化劑，以防食物出現酸敗。

We all know that oxygen in air keeps us alive. Are you aware that oxygen is also a reason for our food to develop the distasteful smell, the unpleasant colour, and even a change in the texture? The chemical reaction between oxygen in air and the food substances, called oxidation, is undesirable in most foodstuffs. In this article, let's look at the magic of a group of food additives that prevent oxidation in food – antioxidants.



配料：
馬鈴薯，植物油，燒烤味調味料(酵母抽提物，增味劑(E621)，麥芽糊精，食用鹽，香辛料，調味料，白砂糖，抗結劑(E341(iii)，E551)，水解植物蛋白，乳清粉，色素(E150d))，抗氧化劑(E320、E321、E310)。
(含有麩質製品、大豆製品、奶類製品)。

Ingredients:
Potato, Vegetable Oil, Barbecue Flavour (Yeast Extract, Flavour Enhancer (E621), Maltodextrin, Salt, Spices, Flavour, Sugar, Anticaking Agent (E341(iii), E551), Hydrolyzed Vegetable Protein, Whey Powder, Colour (E150d)), Antioxidant (E320, E321, E310).
(Contains Gluten Products, Soybean Products, Milk Products).

部分薯片會使用抗氧化劑，以防止有不良味道和氣味
Antioxidants are used in some potato chips to prevent the unpleasant off-flavours and odours

The Technology

In food industry, preservatives and antioxidants are often used to prolong the shelf-life of foods by protecting against deterioration. While preservatives act against microorganisms, antioxidants counter oxidation. Fats and oils, vitamins and amino acids are most often troubled by oxidation.

Fats and oils, particularly the unsaturated ones, as well as foods containing them are most likely to have oxidation problems. When the fats react with oxygen and decompose, unpleasant off-flavours and odours will be developed and cause the foods go rancid. Rancid foods may not result in food poisoning, but they have such a bad smell and taste that you may shy away from eating them. Some food manufacturers thus use antioxidants in foods rich in fats and oils to delay the onset or slow down the development of rancidity due to oxidation. Just check the label on a pack of potato chips and you will see the name or the identification number of the antioxidant together with its technological function i.e. antioxidant listed!

Vitamins and amino acids in foods are easily destroyed by oxidation and may result in discolouration and loss of nutritive value. Antioxidants are therefore also used to preserve foods rich in vitamins such as processed fruits and vegetables. In addition, you may be surprised that the seafood industry use antioxidants to prevent black spot formation caused by amino acid oxidation in their produce such as shrimps and prawns.

Commonly Used Antioxidants

Like other food additives, antioxidants can be natural or synthetic. Ascorbic acid (vitamin C) is naturally occurring and is the most commonly used antioxidants in food. Want to see for yourself how it works? Add a few drops of lemon juice to a piece of apple. The vitamin C in the lemon juice will stop the apple from browning! Vitamin C and its related substances are usually added to juice drinks, jams and sausages etc to inhibit oxidation.

Because of more effective function and lower cost, food manufacturers also use various man-made antioxidants, alone or in combinations, in our foods. The common synthetic antioxidants include gallates, butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT). Meat pies, salad dressings, or any other food rich in fats or oils may contain one or more of these antioxidants to protect them from going rancid.

抗氧化劑的規管

在本港，抗氧化劑的使用受《食物內防腐劑規例》規管。該規例最近修訂，已於二零一零年七月一日生效。在加入愈瘡樹脂、檸檬酸異丙酯、氯化亞錫、特丁基對苯二酚和硫代二丙酸鹽五種抗氧化劑後，本港現時一共有13種抗氧化劑獲准用於多種食物中。

Regulatory Control of Antioxidants

In Hong Kong, the use of antioxidants is regulated under the Preservatives in Food Regulation, which had recently been amended and came into effect on 1 July 2010. Together with the five newly permitted antioxidants (i.e. guaiac resin, isopropyl citrates, stannous chloride, tertiary butylhydroquinone (TBHQ) and thiodipropionates), a total of 13 antioxidants are permitted in various foods in Hong Kong.

食物事故點滴 Food Incident Highlight

安全使用即棄PET膠樽

食物安全中心最近發出《風險簡訊》，向市民提供有關正確重複使用盛載水或飲料的即棄PET(或PETE，即聚對苯二甲酸乙二醇酯)膠樽的建議。

PET塑膠可安全用作食物接觸物料，但不當使用PET膠樽會導致較預期多的化學物遷移。當膠樽接觸的溫度達到攝氏70度時，膠樽亦可能會變形。消費者不應重複使用破裂或內部破損的PET膠樽；不應注入熱飲；以及不應盛載與原來物質極為不同的液體，例如原本盛載飲用水的膠樽不應用來盛載醋或油。

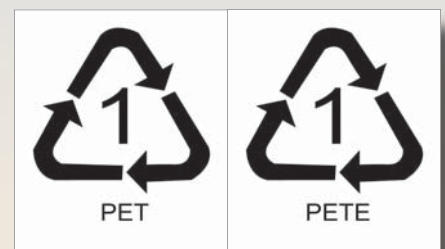
PET膠樽也正如其他食物容器或用具一樣，必須保持清潔，並確保樽內完全風乾，才可重複使用。如需使用較長時間，應避免直接接觸樽口飲用飲料，以防止微生物滋生。

Safe Use of PET Disposable Bottles

The Centre for Food Safety recently issued a Risk-in-brief on reusing disposable water and beverage bottles made of PET (or PETE, stands for polyethylene terephthalate plastic) providing advice on their proper usage.

PET plastics can be safely used as food contact material. However, misuse of PET bottles can result in release of greater amount of chemical substances. They may also deform when contact temperature reaches 70°C. Consumers should not reuse the bottles if there are cracks or other damages to the interiors, should not use the bottle for hot drinks, and not for substances significantly different from what the bottles are intended for. For instance, a bottle initially made for containing drinking water should not be used for vinegar or oil.

Like all other food containers or utensils, it is crucial to maintain the cleanliness of such bottles and make sure they are adequately dried before reuse. Drinking directly from the mouth of the bottle may impart microbes to the bottles and is not recommended if prolonged use is required.



為保安全，必須正確使用可循環再用的PET膠樽。
Proper use of recyclable PET bottles to ensure safety.

食物中毒與進食海龜

印度太平洋地區間會出現由進食海龜引致的食物中毒個案，症狀包括急性口腔炎或口腔潰瘍、噁心及嘔吐，並有死亡個案。人們吃海龜因為其味道獨特、文化因素或據稱具有食療功效。

海龜會吃軟體類動物、海藻、海草、海綿和魚等不同食物，故體內可能積聚藻類毒素、重金屬及其他污染物。本港常見菜式中的龜種有三線閉殼龜／金錢龜和鱉／水魚等，全部屬於淡水龜。野生海龜受《野生動物保護條例》規管，並有較高的食用安全風險，因此不建議食用。

Food Poisoning and Consumption of Sea Turtles

Food poisoning cases with symptoms like acute oral inflammation and ulcers, nausea and vomiting due to consumption of sea turtles are reported sporadically throughout the Indo-Pacific region. In some cases, deaths were also reported. People eat sea turtle for taste, cultural significance or reputed therapeutic function.

Sea turtles eat a wide variety of food, including mollusks, seaweeds, sea grass, sponges and fish. It is possible that algal toxins, heavy metals and other contaminants are accumulated in their bodies. Turtles found in common local dishes, including the three-banded box turtle and the Chinese soft-shelled turtle, are freshwater species. Wild sea turtles are not recommended for food use as they are under the control of the Wild Animal Protection Ordinance and of higher food safety risk.

風險傳達 工作一覽 Summary of Risk Communication Work

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