

食物安全焦點

Food Safety Focus



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Centre for Food Safety

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風險評估組

科學主任陳蓉蓉女士報告

Reported by Ms. Melva CHEN, Scientific Officer,
Risk Assessment Section,
Centre for Food Safety

最近，有兩家台灣公司被揭發以低價棉籽油摻雜橄欖油、花生油和麻油等食油出售。傳媒報道，棉籽油含有一種名為棉酚的有毒物質，可導致不育，對健康有害。本文將探討棉籽油的安全問題。

棉籽油

棉籽油即以棉花籽提煉的油，是提取棉纖維的副產品。棉籽含豐富油脂和蛋白質，可用來榨取棉籽油和作為牛羊的飼料補充劑。聯合國糧農組織指出，棉籽油是一種植物油，主要作為食物。中國是世界上最大的棉籽油生產地，其次是印度、巴基斯坦、美國和烏茲別克斯坦。棉籽油可用於製造沙律油(蛋黃醬、沙律醬、醬汁及汁料)、商業及家用食油、烘焙食品及蛋糕糖霜用的人造牛油或起酥油。此外，還有一定數量的棉籽油用作肥皂、化妝品等工業產品的製作原料。雖然煮食用的棉籽油在本港零售店並不常見，但某些烘焙食品 and 油炸小食含有棉籽油。

發現粗製棉籽油與不育有關的由來

研究人員在五十年代發現粗製棉籽油與不育有關。當時在中國，研究人員一直奇怪為何有多個農村地區出現不育現象。最終，他們發現這是用粗製棉籽油(從棉籽中榨取而未經提煉的油)煮食所致。食用此油多年後，男性變得不育，很多婦女

Recently, two Taiwanese companies were found to be selling various edible oils such as olive oil, peanut oil and sesame oil adulterated with the cheaper cottonseed oil. Media reported that cottonseed oil can be risky to health since cottonseeds contain a toxic substance called gossypol that can cause infertility. This article discusses cottonseed oil and its safety.

Cottonseed Oil

Cottonseed oil is extracted from cottonseeds which are by-products of cotton fibre production. Cottonseeds are rich in oil and proteins and are therefore used for cottonseed oil production and as a feed supplement for cattle and sheep. According to the Food and Agriculture Organization of the United Nations, cottonseed oil is a type of vegetable oil used mainly as food. China is the world's largest cottonseed oil producer, followed by India, Pakistan, the USA and Uzbekistan. Cottonseed oil can be used to make salad oil (mayonnaise, salad dressings, sauces and marinades), cooking oil for frying in both commercial and home cooking, and margarine or shortening for baked goods and cake icings. Besides, limited quantities may be used for producing industrial products such as soaps and cosmetics. Although cottonseed oil is not commonly sold as cooking oil in retail stores in Hong Kong, it is present in some foods such as bakery products and fried snacks.

History of Crude Cottonseed Oil and Infertility

The link between crude cottonseed oil and infertility was found in the 1950s. Investigators had been puzzled by the outbreaks of infertility reported in a number of rural communes in China. Eventually they discovered that the phenomenon was caused by the use of crude cottonseed oil (where the oil was being pressed out of the seeds without



棉籽油提取自棉花的種子。(照片由美國農業部提供)
Cottonseed oil is extracted from the seeds of cotton plants. (Photo by courtesy of the US Department of Agriculture)

焦點個案
Incident in Focus

出現閉經的現象。經過進一步調查，證實罪魁禍首是棉花裡一種叫棉酚的黃色化合物。

精煉過程可去除棉酚

棉籽的棉酚含量最高，但棉花植株其他部分也含有棉酚。棉酚能令昆蟲不育，是棉花對付獵食者的天然防護罩。棉酚會令男人的精子數量減少，但不具基因毒性。棉籽油經過精煉的步驟可去除棉酚並製成食用油。一九六七年，國際脂肪和油類法典委員會認為，市面銷售的通常是不含棉酚的精煉棉籽油，不存在安全問題。此外，台灣當局在二零一三年十月二十五日公布，因應最近的事件而檢測的棉籽油和其他食油全部不含棉酚。

本港情況

雖然精煉棉籽油可以食用，但在本港售賣摻雜或假食油是違法的。食油應適宜供人食用，並符合法例規定，包括商品說明和食物標籤方面的規定。食物安全中心會繼續監察事態的最新發展及食油的食用安全。

注意要點：

- 市面銷售的棉籽油一般經過精煉，基本上不含棉酚，可放心食用。
- 部分食品，如烘焙食品及油炸小食等或含棉籽油。
- 在本港出售摻雜或假食油是違法的。

給市民的建議

1. 進食不同種類的食物和維持均衡的飲食習慣。
2. 烹調食物時，應減少使用油脂，因為無論是哪種油脂，只要攝入過量，都會增加超重和患肥胖症的風險。

給業界的建議

1. 為食品加上適當的標籤。
2. 從可靠的供應商採購食油。
3. 確保使用的是可安全食用的精煉棉籽油。

further processing) for cooking. After using this oil for years, the men became infertile and many women had amenorrhoea (absence of menstruation). Further investigation revealed that the culprit was gossypol, a yellow compound produced in cotton plant.

Gossypol is Removed from Oil Refinery

Gossypol is concentrated in the cottonseed but can also be found in other parts of the cotton plant. It acts as a natural defensive agent against predators, provoking infertility in insects. In men, it affects sperm production. Nevertheless, gossypol is not genotoxic. During cottonseed refining process, gossypol is removed to produce edible oil. In 1967, the Codex Committee on Fats and Oils concluded that gossypol did not present a problem in cottonseed oil, since cottonseed oil was normally sold refined and thus virtually free of gossypol. Taiwan authority announced on 25 October 2013 that gossypol was not found in any of the cottonseed oil and other cooking oils tested in response to the recent incident.

Local Situation

Although refined cottonseed oil is edible, it is illegal to sell adulterated or counterfeit cooking oils in Hong Kong. Cooking oils should be fit for human consumption and comply with legal requirements including requirements of trade descriptions and food labelling. The Centre for Food Safety will continue to monitor the latest development of the incident and the safety of cooking oils.

Key Points to Note:

- Cottonseed oil is normally sold refined which is virtually free of gossypol and safe for consumption.
- Cottonseed oil may be present in some foods such as bakery products and fried snacks.
- It is illegal to sell adulterated or counterfeit cooking oils in Hong Kong.

Advice to the Public

1. Maintain a varied and balanced diet.
2. Reduce the use of oils/fats when preparing food because excessive intake of oils/fats, regardless of the type, increases risk of overweight and obesity.

Advice to the Trade

1. Label food products properly.
2. Source cooking oils from reliable suppliers.
3. Make sure the cottonseed oil used is refined and safe for consumption.

風險傳達 工作一覽 Summary of Risk Communication Work

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我們吃的蔬果含毒素嗎？ Toxins in Our Fruits and Vegetables?

食物安全中心
風險評估組
科學主任游天頌先生報告

Reported by Mr. Arthur YAU, Scientific Officer,
Risk Assessment Section,
Centre for Food Safety

由本期開始，我們將會一連三期介紹食物中的天然毒素。

蔬果是健康飲食不可或缺的一部分。然而，部分蔬果為了防禦真菌、昆蟲和獵食者，會產生一些天然毒素。不過，我們可以使用各種烹煮和處理方法把這些毒素減到最少，令它們可安全食用。

去除有毒的部分

有些食物的天然毒素集中在某些部位，只要把這些有毒的部位去除，便可去除毒素。舉例來說，蘋果和梨子的種子含有氰苷，人們咀嚼或消化這些水果的種子時，內含的氰苷會變成有毒的氰化氫。但只要去核後才榨果汁或製成果蓉，問題便可解決。由於幼兒對氰化氫特別敏感，因此要加倍小心。同樣道理，核果如杏、李子、西梅乾、桃和櫻桃的種子都不宜食用。

馬鈴薯一般含少量天然毒素苷生物鹼，但在發綠、發芽或損壞後苷生物鹼會大增。大部分苷生物鹼集中在馬鈴薯發芽、發綠和損壞部分，並會令馬鈴薯帶苦味。如馬鈴薯出現上述情形，應整個丟掉，因為很難判斷要把薯皮或發芽部分削多深才算安全，而且烹煮過程不能破壞苷生物鹼。為免馬鈴薯變綠、發芽而產生苷生物鹼，馬鈴薯應貯存在陰涼乾爽的地方。

徹底煮熟

適當處理和烹調可以把竹筍、北杏等食物中的氰苷含量減到安全水平。要安全食用竹筍，應把竹筍去皮、切成薄片和徹底煮熟。同樣地，北杏必須用清水浸透，並以沸水（例如湯）徹底煮熟後再多煮一段時間，以把裡面的氰苷減到安全水平。

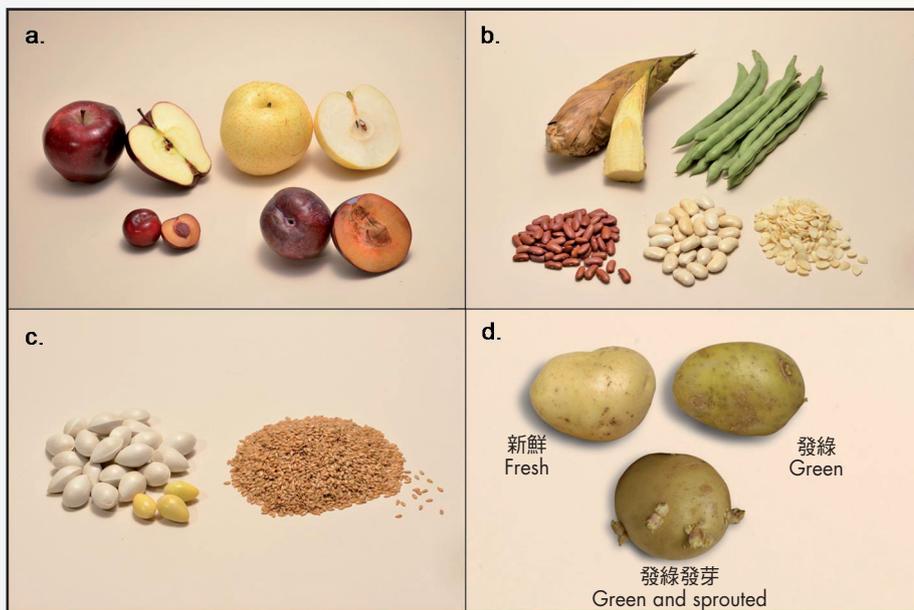
植物血球凝集素是一種天然毒素，一般存在於生的青豆、紅腰豆和白腰豆等豆類。要安全食用，乾的豆類必須先以清水浸透；而無論是新鮮的豆還是乾豆，都要以沸水徹底煮熟，才

This article is the first in a series of three articles on natural toxins in food.

Fruits and vegetables constitute an important part of a healthy diet. However, certain common fruits and vegetables contain a number of naturally occurring toxins that are often produced to protect the plants from fungi, insects and predators. Various cooking and preparation methods can help reduce the toxins to a lower level and render them safe for human consumption.

Remove the Toxic Parts

In certain food, the natural toxins are concentrated only in particular parts. Removal of these toxic parts can render the food free from the toxins.



含有天然毒素的蔬果只要去除有毒的部分(a)；徹底煮熟(b)；以及限量進食(c)，便可安全無虞。切勿食用發綠或發芽的馬鈴薯(d)。
Various fruits and vegetables that contain natural toxins can be rendered safe for consumption by removing toxic parts (a), thorough cooking (b) and restricting consumption (c). Green or sprouted potatoes should not be consumed (d).

For example, the cyanogenic glycoside in apples and pears are found in the seeds, where toxic hydrogen cyanide can be released during chewing or digestion. By avoiding the seeds or removing them before making juice and puree, the products will be free of cyanide. This is especially important for young children who are more sensitive to cyanide. Similarly, the seeds of stone fruits like apricots, plums, peaches and cherries should not be consumed.

For green, sprouted or damaged potatoes, the level of the natural toxin glycoalkaloids will increase significantly compared with the low levels in non-green ones. Glycoalkaloids are concentrated in or near the sprouts, green and damaged areas. They will impart a bitter taste to the food. It is best to discard the whole potato that is green, sprouted or damaged as it is not easy to judge how much of the parts below the peels or near the sprouts to remove in order to render the potato safe. And cooking cannot destroy glycoalkaloids. Potatoes should be stored in cool dark places to prevent them from turning green or sprouting and produce glycoalkaloids.

Thorough Cooking

The level of cyanogenic glycoside in bamboo shoots, bitter apricot seeds, etc. can be reduced to safe levels through proper preparation and cooking. Bamboo shoots should be peeled, cut into smaller pieces and cooked thoroughly to reduce the level of cyanogenic glycosides to a safe level. Similarly, the bitter apricot seeds should be soaked and cooked thoroughly in boiling water (e.g. soup) but for longer period to destroy the cyanogenic glycoside present.

Lectin is a natural toxin that is commonly found in raw green beans,

能破壞裡面的植物血球凝集素。切勿進食生的或未經煮熟的豆類。罐裝豆在高溫處理的過程中，植物血球凝集素已被破壞。

限量進食

一些亞麻籽的食譜只用乾熱烹煮（如烘焙食品），但這種烹調方式降低亞麻籽氰苷含量的效果不如濕熱烹煮（例如水煮），因此不宜進食太多用這種方式烹煮的亞麻籽。

銀杏的種子（白果）是中國和其他東南亞國家的傳統食物。白果含天然毒素4'-甲氧基吡哆醇。雖然這種毒素十分耐熱，烹煮不會降低其毒性，但仍建議用水烹煮白果，因為這樣做可以消滅白果中的其他天然毒素。白果每次最多只可吃幾顆。

結論

蔬果有助我們保持飲食均衡。只要對蔬果的天然毒素有正確的認識，並作適當的處理，很多蔬果都是可以安全食用的。

red kidney beans, white kidney beans, etc. To safely consume these vegetables, the dried beans should be soaked thoroughly and that both the fresh and dried ones should be cooked thoroughly at boiling temperature to destroy the lectin present. Raw or undercooked beans should be avoided. Canned beans had undergone high heat treatment during production and therefore the lectin is destroyed.

Restrict Consumption

For flaxseeds, some recipes only require dry heat treatment (e.g. in bakery products), the cyanogenic glycoside content could not be reduced as effectively as in moist heat cooking (e.g. boiling). In this sense, flaxseeds should be consumed in moderation.

The seeds of *Ginkgo biloba*, a food traditionally consumed in China and other Southeast Asian countries, contain a natural toxin called 4'-methoxypyridoxine (4'-MPN). Although 4'-MPN is a heat stable substance that cannot be inactivated by cooking, boiling of ginkgo seeds are still advised as boiling can destroy other natural toxins present. Consumption of ginkgo seeds should be limited to a few pieces each time.

Conclusion

With the proper knowledge and handling procedures, many vegetables and fruits can be enjoyed as important components of a balanced diet without much issue.



加州海岸捕獲的藍鱈吞拿魚驗出含輻射

最近有研究報告指在加州對開海域捕獲的藍鱈吞拿魚受源自福島核事故的放射性銫污染，報道引起市民關注。

放射性銫的半衰期較長，而且可在環境中殘留多年。藍鱈吞拿魚可能是游經受污染水域，或進食了受污染的海洋生物，而攝入放射性銫。美國食物及藥物管理局進行的評估顯示，吞拿魚驗出的放射性銫含量遠低於食品法典委員會的指引限值，對健康無礙。

二零一一年日本發生核事故後，食物安全中心(中心)已加強從入口和零售兩方面監察日本進口食物的輻射水平，以確保本港出售的食物安全。中心會密切監察有關情況。

Bluefin Tuna Caught off California Coast Detected with Radioactivity

Recently, a study reported that bluefin tuna caught in the waters off California were contaminated with radiocaesium originated from Fukushima and this has raised public concern.

Radiocaesium has a relatively long half-life and lingers in the environment for many years. Bluefin tuna can be contaminated with radiocaesium when they swim through the contaminated water or by eating marine organisms that have already been contaminated. However, evaluation conducted by the US Food and Drug Administration revealed that the levels of radiocaesium detected in the tuna fish were far below the Codex guideline level and indicates no health concerns.

After the nuclear incident in Japan in 2011, the Centre for Food Safety (CFS) has stepped up surveillance for radioactivity for food imported from Japan at both import and retail levels to ensure that food for sale in Hong Kong is safe for consumption. The CFS would continue to closely monitor the situation.

光波爐與煮食溫度

光波爐利用遠紅外線進行加熱和烹煮食物，可用作乾熱烹煮。隨着其日益普及，開始有人關注用光波爐製作的食物的安全問題。食物安全中心(中心)就這個問題發布了風險簡訊，並在中心Facebook專頁以專文說明。

濕熱烹煮(例如蒸和煮)是健康的煮食方法。相反，食物在煎炸、烘焙和燒烤等乾熱烹煮過程中會因高溫而釋出有害的污染物。烹煮時間愈長、溫度愈高，所產生的污染物也愈多。因此，無論是用平底鍋、電燒烤爐、焗爐，還是光波爐，只要是以高溫乾熱烹煮食物，都有可能產生污染物。

無論是哪種烹煮方式，市民在確保食物徹底煮熟之餘，不宜用過高的溫度烹煮食物。消費者亦不宜過量進食以高溫乾熱烹煮方法烹製的食物，以減少攝入在高溫下產生的污染物。

Cooking Temperature and the Use of Halogen Oven

Halogen oven uses infrared radiation to heat and cook food and can be used for dry heat cooking. As it has become increasingly popular, some people has raised concerns about its food safety. The Centre for Food Safety (CFS) has issued a Risk in Brief and a message on the CFS Facebook page advising the public on its use.

Moist heat cooking (e.g. steaming and boiling) is a healthy cooking method. Dry heat cooking at high temperatures such as frying, baking, grilling and barbecuing may produce harmful contaminants that increase with the cooking duration and temperature. Therefore, these process contaminants may be formed in a similar way, whether by using pan, electric grill, conventional oven or halogen oven, as a result of dry heat cooking at high temperatures.

Regardless of the cooking method used, the public is advised not to over-heat food while ensuring the food is cooked thoroughly. Consumers should avoid overindulgence in foods cooked at high temperatures in dry heat to reduce exposure to heat-generated contaminants.