食物安全焦點
Food Safety Focus

食物安全中心 Centre for Food Safety

食物環境衞生署 Food and Environmental Hygiene Department

二零一三年一月 · 第七十八期
January 2013 · 78th Issue
ISSN 2224-6908

由食物環境衞生署食物安全中心於每月第三個星期三出版
Published by the Centre for Food Safety, Food and Environmental Hygiene Department on every third Wednesday of the month

本期內容 IN THIS ISSUE

焦點個案 Incident in Focus

苯並[a]芘與地溝油
Benzo[a]pyrene and Gutter Oil

食物安全中心
風險評估組
科學主任鍾可欣女士報告

Reported by Ms. Ho-yan CHUNG, Scientific Officer,
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近日有傳媒報道指，有懷疑無牌的食品加工場涉嫌出售質素有問題的食油。根據報道，有關食油的苯並[a]芘超出歐盟標準。食物安全中心(中心)即時作出跟進，到有關加工場巡查及抽取食油樣本作苯並[a]芘測試。

苯並[a]芘從何來

苯並[a]芘是一種多環芳香族碳氫化合物(polycyclic aromatic hydrocarbons，簡稱PAHs)，而PAHs是一種在環境中無處不在的污染物。除大自然外(如山火)，其他燃燒活動包括家居採暖(例如燒煤和燒柴)、工業活動(例如燒垃圾、冶煉金屬和生產焦炭)、車輛排放的廢氣和香煙的煙霧都含有PAHs，對空氣、水、食物、土壤和沉積物造成污染。

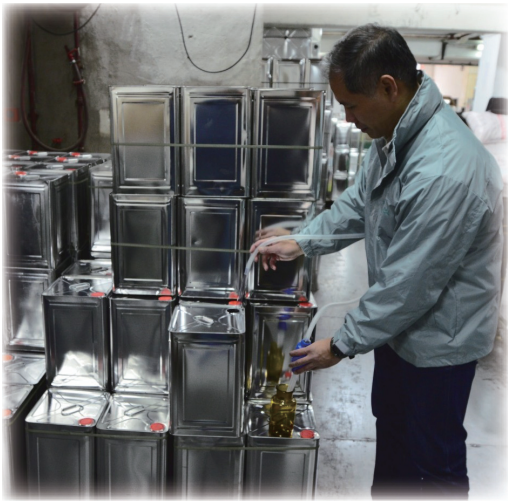
食物中的苯並[a]芘主要有兩個來源：其一是農作物吸收了污染空氣中沉降的苯並[a]芘；其二是食物在烘焗、煙熏和燒烤等加熱過程中產生和積聚苯並[a]芘。

食油中的苯並[a]芘

食油含有苯並[a]芘，可能是用以製作植物毛油的穀物和植物早已受到空氣、水和土壤等所污染。此外，如果直接使用燃燒產生的氣體烘乾穀物和植物，穀粒和油籽接觸到燃燒所產生的物質，也會導致食油產品受PAHs污染。不過，食油的精煉過程能把苯並[a]芘水平大大降低。而苯並[a]芘最終的水平則取決於精煉的條件。歐盟委員會在二零零四年曾報告各種食油的苯並[a]芘水平，其中有170個食油樣本(佔8%)的苯並[a]芘水平高於每公斤5微克。

苯並[a]芘與地溝油

何謂“地溝油”，至今未有一致定義，一般泛指由去水渠(地溝)收集的廢油。目前還沒有一種特定的科學方法檢測和鑑別地溝油。食油中驗出苯並[a]芘並不代表這些油就是地溝油，食油可能因種種上文提及的原因而含有苯並[a]芘，而且翻用食油會增加苯並[a]芘的水



食物安全中心即時作出跟進，抽取食油樣本作苯並[a]芘檢測
The Centre for Food Safety has taken immediate follow-up actions to collect oil samples for B[a]P testing

Recently, media have reported that cooking oil from a suspected unlicensed establishment supplying cooking oil for sale was alleged to be of substandard quality, containing benzo[a]pyrene (B[a]P) exceeded the European Union (EU) standard. The Centre for Food Safety (CFS) took immediate follow-up action, inspected the establishment and collected cooking oil samples for B[a]P testing.

Source of B[a]P

B[a]P is a kind of polycyclic aromatic hydrocarbons (PAHs), a contaminant which is ubiquitous in the environment. Apart from natural sources (e.g. forest fires), other combustion processes resulting in contamination of air, water, food, soil and sediment include residential heating (e.g. coal and wood-burning stoves), industrial activities (e.g. refuse burning, smelting and coke production), vehicle exhausts and cigarette smoke.

The two major sources of B[a]P in food are deposition and uptake of B[a]P from polluted air on food crops, and formation and deposition of B[a]P in food during heat processing using methods such as roasting, smoking, and grilling.

Occurrence in Cooking Oil

Cereals and plants used for production of crude vegetable oils may be contaminated by air, water, soil, etc. Furthermore, drying of cereals and plants using direct application of combustion gases can result in contamination of the product with PAHs as the combustion products may come into contact with the grain and oil seeds. Refining processes can reduce the level of B[a]P in cooking oil and the final levels depend on the refining conditions adopted. The European Commission reported in 2004 about the levels of B[a]P in various types of oils, among which, about 170 oil samples (8%) had B[a]P levels higher than 5 µg/kg.

B[a]P and Gutter Oil

There is no agreed definition of gutter oil. Generally, it refers to discarded oil recovered from gutters and ditches. There is no established scientific method to identify gutter oil at present. The presence of B[a]P in cooking oil does not mean that the oil is gutter oil as B[a]P may be present in cooking oil as a result of the reasons mentioned in the preceding paragraph and the level may increase upon repeated use. Nevertheless, the quality and safety of

焦點個案
Incident in Focus

平。我們可以通過化學測試的方法，檢測有害物質的含量，從而監察食油的質素及安全性。

苯並[a]芘對健康的影響

苯並[a]芘對人類基因有害，並會致癌。世界衞生組織的國際癌症研究機構在二零零九年把苯並[a]芘列為“令人類患癌”的物質。由於不能釐定苯並[a]芘的安全參考值，市民應盡量減少攝入苯並[a]芘。

苯並[a]芘的規管標準

食品法典委員會並未就食物中的苯並[a]芘訂下標準。食用植物油中的苯並[a]芘在歐盟及內地的標準分別為每公斤2微克及10微克。雖然現時香港並沒有就食物中的苯並[a]芘含量制定法定限值，但中心最近為食油中的苯並[a]芘含量制定了每公斤10微克的暫定行動水平。《公眾衞生及市政條例》(第132章)第54條規定，所有供出售的食物(包括食油)必須適宜供人食用。若食用植物油樣本被檢出苯並[a]芘含量超出暫定行動水平，中心會進行風險評估，以確定其會否對健康構成風險。

香港食油的檢測結果

食物環境衞生署十多年來一直有監察食油中的苯並[a]芘水平。二零一二年，中心曾透過專項調查計劃抽驗翻用食油，全部測試結果滿意。文初所述的事件曝光後，中心立即抽取食油樣本作苯並[a]芘檢測。截至二零一三年一月十六日為止，有三個取自進口商和供應商的食油樣本的苯並[a]芘含量超出暫定行動水平。一個取自屯門某糧油供應商的樣本的苯並[a]芘含量為每公斤17微克，是苯並[a]芘含量最高的樣本。中心參照暴露限值對該樣本的檢測結果進行風險評估，評估結果顯示，食用該食油對公眾健康構成的風險應該不大。另外，所有從食肆抽取的樣本，不是沒有驗出苯並[a]芘就是含量低於暫定行動水平。但為慎重起見，中心已要求供應商停止供應有關產品，並向客戶全面回收。

為進一步釋除公眾疑慮，中心正再一次進行專項食品調查，從供應鏈的不同層面抽取食油樣本進行化驗，以確保市面上的食油符合本港法例規定和適宜供人食用。

注意要點

- 苯並[a]芘在環境中無處不在。
- 環境污染、食油的製作過程和食物加工過程均可能導致食油含苯並[a]芘。
- 目前還沒有一種特定的科學方法檢測和鑑別地溝油。

給業界的建議

1. 使用安全和質素符合標準的食油。
2. 按照《食物安全條例》(第612 章)的要求，妥為備存記錄，以便在有需要時追查食物來源和去向。
3. 向可靠的供應商採購食物，包括：
   - 供應商是否有相關食物業牌照；
   - 有否根據《食物安全條例》(第612 章)登記為食物進口商或分銷商；以及
   - 了解食材的來源及質素。

給市民的建議

1. 應保持均衡及多元化飲食，進食多種蔬果。
2. 切勿多次翻用食油。
3. 減少食用脂肪和油，以減少攝入苯並[a]芘。

cooking oil could be monitored by conducting chemical tests to ascertain the amount of harmful substances contained.

Health Effects of B[a]P

B[a]P is toxic to genes and can cause cancer in human. In 2009, the International Agency for Research on Cancer of the World Health Organization classified B[a]P as “carcinogenic to human” . As its safety reference value cannot be determined, B[a]P intake should be reduced to a level as low as practicable.

Regulatory Standards for B[a]P

The Codex Alimentarius Commission has not established standard for B[a]P in food. The standards for B[a]P in vegetable oil in the EU and Mainland China are 2 μg/kg and 10 μg/kg respectively. The existing Hong Kong legislation does not stipulate the statutory limits of B[a]P in food. However, the CFS has recently established a provisional action level of 10 μg/kg for B[a]P in cooking oil. Section 54 of the Public Health and Municipal Services Ordinance (Cap. 132) also stipulates that all food (including cooking oil) for sale must be fit for human consumption. Risk assessment will be conducted to assess the health risk of B[a]P in edible vegetable oil if the provisional action level is exceeded.

The Findings on Cooking Oil in Hong Kong

The Food and Environmental Hygiene Department has been monitoring levels of B[a]P in cooking oil for more than ten years. In 2012, the CFS carried out a targeted surveillance project on used cooking oil with results satisfactory. In response to the recent incident, the CFS immediately collected cooking oil samples for B[a]P testing. As of 16 January 2013, three samples taken from importer and suppliers were found to contain B[a]P at levels higher than the provisional action level. A sample collected from a supplier in Tuen Mun contained the highest B[a]P level at 17 μg/kg. The risk assessment result adopting the margin of exposure approach suggested that the health risk for consuming the oil sample in question should not be high. On the other hand, samples collected from food premises contained either no detectable B[a]P or with levels lower than the provisional action level. As a prudent measure, the CFS has requested the cooking oil supplier concerned to stop selling and recall the affected product.

To further allay public concerns, the CFS has embarked on an additional targeted food surveillance project on cooking oil. Samples have been taken from different stages of the food supply chain to ensure that the products are in compliance with the legal requirements in Hong Kong and are fit for human consumption.

Key Points to Note

- B[a]P is ubiquitous in the environment.
- B[a]P may be present in cooking oil as a result of environmental contamination and its generation during oil production and food processing.
- There is no established scientific method to test and identify gutter oil so far.

Advice to the Trade

1. Only use cooking oil satisfying safety and quality requirements.
2. Maintain proper records in accordance with the Food Safety Ordinance (Cap. 612) to allow food tracing.
3. Source food from reliable suppliers, including -
   - checking whether they possess the relevant food business licenses;
   - checking whether they are registered as food importers or distributors under the Food Safety Ordinance (Cap. 612); and
   - checking the source and quality of the food ingredients.

Advice to the Public

1. Maintain a balanced and varied diet, which includes a wide variety of fruits and vegetables.
2. Do not reuse cooking oil repeatedly.
3. Reduce consumption of fats and oils to reduce B[a]P exposure.

食物安全平台
Food Safety Platform

嬰兒配方奶中的常量營養素
Macronutrients in Infant Formula

食物安全中心
風險評估組
科學主任廖珮珊女士報告

Reported by Ms. Melissa LIU, Scientific Officer,
Risk Assessment Section,
Centre for Food Safety

由本期開始，我們將一連四期探討配方奶和嬰幼兒食品中的營養素。

嬰兒的營養需要

嬰兒必須從膳食中獲得充足的營養，才能生長、修復組織和保持身體健康。母乳是天然的營養來源，能全面滿足嬰兒在進食補充食物前的營養需要，是嬰兒的最佳食物。但是，如果餵哺母乳不可行，母乳的仿製品──嬰兒配方奶便是嬰兒賴以滿足營養需要的食品。

食物中的能量來自碳水化合物、脂肪和蛋白質，為嬰幼兒提供每天活動和生長發育的燃料。碳水化合物是能量的主要來源，當碳水化合物攝取充足時，膳食中的脂肪和蛋白質便得以在體內發揮其他重要功能，例如構造新組織。

脂肪提供腦部和眼睛正常發育所需的脂肪酸，並有助吸收脂溶性維他命。人體內儲存的脂肪可減少體熱流失和保護體內器官。蛋白質的功能則是修復身體組織，製造激素、抗體和酵素。

然而，營養攝入過量會影響健康。舉例來說，攝入過多蛋白質會增加腎臟的負荷。攝入過多能量會造成肥胖症。兒童肥胖症是本港的重要公共衞生議題之一。衞生署去年發表的研究報告顯示，在零至五歲的兒童中，有12.7%和2.7%分別屬於“可能有過重風險”和“過重或肥胖”。

餵哺配方奶與過重

嬰兒的能量和營養需要取決於很多因素，包括年齡、體型和生長速度等。以母乳餵哺的嬰兒一般能夠按自己的能量需要調整食量。媽媽的身體亦會因應寶寶不同時期的生長需要，製造出成分最合適的母乳，給予孩子量身定做的最佳營養。

相反，嬰兒配方奶的營養成分按一般嬰兒的需要為標準而劃一調配，對某些嬰兒而言，因應其個別發育情況，可能提供過多能量和營養素(例如蛋白質)。此外，以奶瓶餵哺的嬰兒容易吃得過量。因此有些研究指出，以配方奶餵食的嬰幼兒較易過重。上文提及的研究報告指出，12至24個月大的幼兒有超過90%仍然以配方奶為惟一的奶類食品，48個月大的兒童有77%仍然飲用配方奶。這些數據令人關注本港家長可能誤以為配方奶較為“優越”，以致過分倚賴用配方奶餵哺幼兒。

餵哺母乳的好處

母乳餵哺對於確保母嬰的生理和心理健康都有公認的優越性。母乳除了可滿足每個寶寶的獨特營養所需，還含有天然抗體、活免疫細胞、酵素等，幫助消化及吸收養分，增強寶寶的免疫力。相反，現時並無足夠的臨床證據，證實吃配方奶的嬰兒的健康可以比得上吃母乳的寶寶。有鑑於此，世界衞生組織建議，寶寶出生最初六個

This article is the first of a series of four articles that focus on nutrients in formula products and foods for infants and young children.

Nutrition for Infants

Infants must obtain optimal nutrition from their diet for growth, tissue repair and maintenance of good health. Breastmilk is a natural source of nutrients and is the best food for infants to wholly fulfil their nutritional requirements before introducing complementary diet. However, when breastfeeding is not feasible, infants would need to rely on an imitated product, i.e. infant formula, as their nutrient source.

Energy in food provides fuel needed for daily activity, growth and development. It comes from carbohydrates, fat and protein, with carbohydrates being our primary source of energy. Getting sufficient carbohydrate intake enables normal and efficient use of dietary fat and protein in the body for other essential functions such as building new tissues.

Fat provides essential fatty acids for normal brain and eye development and absorption of the fat-soluble vitamins. Fat stored in the body also reduces body heat loss and protects body organs. Protein is required for maintaining and repairing body tissues as well as producing hormones, antibodies and enzymes.

Excessive nutrient intake may lead to health concerns. For example, taking too much protein may increase the burden to the kidney. Excessive energy intake may lead to obesity. Childhood obesity is a significant public health issue in Hong Kong. A study published last year by the Department of Health revealed that 12.7% and 2.7% of children aged 0-5 years were “having possible risk of overweight” and “overweight or obese” respectively.

Formula Feeding and Overweight

Energy and nutrient requirements of infants depends on many factors, including age, body size and growth rate. Breastfed infants are normally capable of regulating their food intake to match their energy needs. Mother’s body can also produce breastmilk with composition tailored to the infant’s energy and nutritional requirements at different stages of growth.

In contrast, infant formulae have standardised nutrient contents to cater for the needs of average infants as a whole and may provide excessive energy and nutrients, such as protein, to some infants depending on their stage of development. Besides, bottle feeding often encourages infants eat more than what they should have. Therefore, some studies have suggested that formula-fed infants and young children are more likely to be overweight. According to the above-mentioned study, over 90% of children aged 12-24 months kept drinking formula as their sole source of milk intake, and 77% of the children still used formula at 48 months. This has aroused local concern on over-dependence on formula use, which might occur as a result of parents’ misconception over the “superiority” of formula milk.

Benefits of Breastfeeding

The superiority of breastfeeding in ensuring physical and psychosocial health and wellbeing of mother and child is widely recognised. Apart from providing a tailored source of nutrients, breastmilk contains natural antibodies, living immune cells, enzymes, etc. which aid digestion and absorption of nutrients, and improve babies’ immunity. On the contrary, there is currently no sufficient clinical evidence showing that the health of formula-fed infants is comparable with that of breastfed infants. As such, the World Health Organization has recommended infants to be

月應全吃母乳，其後才逐漸添加補充食物，並繼續餵哺母乳至兩歲或以上。

保障食用配方奶嬰兒的健康

食品法典委員會已建立一套嬰兒配方奶的標準，確保配方奶有恰當的成分組合。政府參照了食品法典委員會的標準及國際間的做法，現正推出一套立法建議，規管擬供36個月以下嬰幼兒食用的配方奶產品和食品的營養成分組合和營養標籤，希望藉着立法加強監管這類產品，令本港嬰幼兒的健康能夠得到更好的保障。

exclusively breastfed for the first six months of life, and thereafter receive complementary foods while breastfeeding continues for up to two years of age or beyond.

Protecting the Health of Formula-fed Infants

Codex has established standards on infant formula products to ensure they have appropriate composition. The Government is currently putting forward a legislative proposal to regulate the nutritional composition and labelling of formula products and foods for infants and young children below the age of 36 months, with reference to Codex standards and international practice. It is hoped that by enhancing the local legislative control on these products, we can better protect the health of infants and young children in Hong Kong.

食物事故點滴
Food Incident Highlight

能量飲品的規管與不良健康影響

美國食物及藥物管理局正在調查多宗飲用能量飲品涉嫌對身體造成不良影響的個案。該局在過去四年接獲18宗死亡及逾100宗受傷害或住院報告，可能與飲用5-Hour Energy、Monster、Rockstar和紅牛(Red Bull)等牌子的能量飲品有關。但值得注意的是，有關這些產品的不良事件都是市民主動向美國食物及藥物管理局舉報的。美國食物及藥物管理局認為市民作出舉報並不代表能量飲品就是造成這些不良事件的肇因。

能量飲品本身一般不含酒精，但可能會添加了咖啡因、牛磺酸、葡萄糖醛酸內酯和多種維他命B等。除咖啡因可能導致兒童或對咖啡因敏感的人緊張或焦慮等不良影響，現時沒有證據顯示能量飲品所含的其他物質會對健康造成嚴重的影響。

市面上的能量飲品
Energy drinks available on the market

消費者，特別是孕婦、授乳婦女、兒童和對咖啡因敏感的人士切勿過量飲用能量飲品等含咖啡因的飲品。飲用能量飲品時，應留意標籤上製造商建議的攝入量，不可過量，更不應同時服用可影響中樞神經系統的物質（例如含酒精飲料或藥物）。

食品法典委員會目前並未就能量飲品訂定標準。在本港，所有供出售的能量飲品必須適宜供人飲用，並須附有標籤表列食物的配料。消費者可透過食物標籤上的配料表得悉能量飲品的成分，作出知情選擇。食物安全中心會密切留意國際上規管能量飲品的最新發展，並在有需要時採取適當的行動。

Regulation of Energy Drinks and Adverse Health Effects

The United States Food and Drug Administration (US FDA) is investigating reports of adverse health events possibly linked to the consumption of energy drinks. Eighteen deaths and over 100 injuries or hospitalisation, allegedly related to energy drinks under the labels 5-Hour Energy, Monster, Rockstar and Red Bull, have been reported to the US FDA over the past four years. However, it is important to note that all adverse event reports which the US FDA has received in connection with the products of concern are voluntary and that the US FDA considers the existence of such reports does not necessarily mean that the drinks have actually caused the adverse events.

Energy drinks are generally non-alcoholic beverages that may contain ingredients such as caffeine, taurine, glucuronolactone and B vitamins, etc. Except for caffeine which may cause adverse effects such as nervousness and anxiety in children and people who are sensitive to caffeine, no evidence shows that any other ingredients in energy drinks can cause serious health effects.

Consumers, particularly pregnant and lactating women, children and individuals sensitive to caffeine, are advised to refrain from drinking excessive amounts of caffeinated drinks, including energy drinks. When consuming energy drinks, one should note the manufacturer's suggestion on intake level on the label and avoid over-consumption. In addition, energy drinks should not be consumed along with other substances (e.g. alcohol or drugs) that affect the functioning of the central nervous system.

There are currently no standards set by the Codex Alimentarius Commission for energy drinks. In Hong Kong, all energy drinks for sale must be fit for human consumption and properly labelled with a list of ingredients. Consumers can find out the composition of energy drinks from the list of ingredients on the food label to make an informed choice. The Centre for Food Safety will closely monitor the international development on the regulation of energy drinks and take appropriate action when necessary.

風險傳達工作一覽
Summary of Risk Communication Work

風險傳達工作一覽（二零一二年十二月） Summary of Risk Communication Work (December 2012)	數目 Number
事故/食物安全個案 Incidents / Food Safety Cases	65
公眾查詢 Public Enquiries	176
業界查詢 Trade Enquiries	96
食物投訴 Food Complaints	295
給業界的快速警報 Rapid Alerts to Trade	23
給消費者的食物警報 Food Alerts to Consumers	2
教育研討會/演講/講座/輔導 Educational Seminars / Lectures / Talks / Counselling	51
上載到食物安全中心網頁的新訊息 New Messages Put on the CFS Website	61