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Food Safety Focus

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焦點個案 Incident in Focus

加工肉類、紅肉與癌症

Processed Meat, Red Meat and Cancer

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,
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世界衛生組織(世衛)屬下的國際癌症研究機構(IARC)於今年十月二十六日就食用加工肉類和紅肉的致癌性發表了最新評估報告。IARC根據證據的力度(並非風險水平),把加工肉類歸類為“令人類致癌”(第1組);紅肉則“可能令人類致癌”(第2A組)。世衛隨後於十月二十九日發表聲明澄清,二零零二年所提出“人們應節制進食保藏的肉製品,以減少患癌的風險”的建議仍然有效。

IARC如何得出加工肉類和紅肉與癌症有關聯的結論?

加工肉類在醃製和煙熏等製作過程中可能會產生致癌物質。醃製肉類時所使用的硝酸鹽和亞硝酸鹽在人體的消化腸道內可被細菌轉化為N-亞硝基化合物,其中一些有可能令人類致癌。此外,紅肉在攝氏200度或以上高溫烹煮時(例如燒烤),會產生雜環胺及多環芳族碳氫化合物等已知或懷疑致癌物質。

IARC對食用加工肉類和紅肉的致癌性所作的評估是以許多國家有不同飲食習慣人群患大腸癌的大量流行病學數據為依據的。紅肉是指未經加工處理的哺乳類動物的肌肉,包括牛肉、豬肉、羔羊肉、羊肉和山羊肉等。加工肉類是指經過鹽漬、發酵或以其他增加口味或改善保存的方法處理過的肉類或肉類,例如香腸、鹹牛肉和肉乾等。食用肉類有可能致癌,被認為與肉類中的N-亞硝基化合物、血紅素鐵和雜環胺等物質有關。

IARC得出結論

認為每天食用50克加工肉類,患大腸癌的風險將增加18%;吃得愈多,風險愈大。但IARC未有訂立一個安全的食用水平。另一方面,雖然有大量證據顯示紅肉與癌症之間存在關聯,但證據不如加工肉類般確鑿。IARC又指出,“對個人來說,因食用加工肉類而患上大腸癌的風險依然很低。”但鑑於全球食用加工肉類的人數眾多,這個結論值得關注。

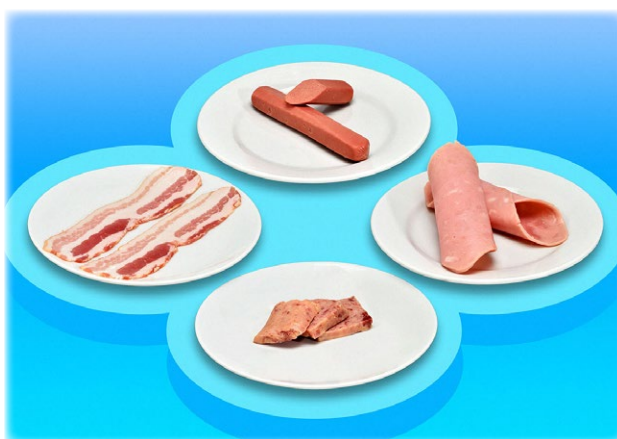
On 26 October 2015, the International Agency for Research on Cancer (IARC), the cancer research arm of the World Health Organization (WHO), issued the latest evaluation on the carcinogenicity of consuming processed meat and red meat. The IARC, based on the strength of evidence and not on the level of danger, has classified processed meat as “carcinogenic to humans” (Group 1) and red meat as “probably carcinogenic to humans” (Group 2A). WHO subsequently issued a statement on 29 October 2015 to clarify that the 2002 health advice that “moderate consumption of preserved meat to reduce the risk of cancer” still stands.

How the IARC Links Processed Meat and Red Meat with Cancer?

Carcinogens may form during the manufacture of processed meat such as curing and smoking. Nitrates and nitrites used for curing meats may be transformed by bacteria in the human digestive tract to N-nitroso compounds, of which some are potentially carcinogenic. Moreover, cooking red meat at high temperatures (200°C or higher) like barbecuing can produce heterocyclic aromatic amines and polycyclic aromatic hydrocarbons which are known or suspected carcinogens.

The IARC evaluation is based on a large amount of epidemiological data among different diets and populations related to colorectal cancer. Red meat refers to unprocessed mammalian muscle meat e.g. beef, pork, lamb, mutton, and goat. Processed meat refers to meat or offal that has been salted, fermented or transformed by other methods to improve preservation or enhance flavour, for example, sausages, corned beef, and jerky. Substances such as N-nitroso compounds, haem iron and heterocyclic aromatic amines present in meat have been identified as part of the mechanism linking meat consumption and cancer formation.

The IARC concludes that each 50g portion of processed meat consumed daily can increase the risk of colorectal cancer by 18%. The risk increases with the amount of meat consumed, but no “safe” level can be devised. On the other hand, the evidence of the relationship between cancer and red meat, though substantial, is not as conclusive as processed meat. The IARC also states that “for an individual, the risk of developing colorectal cancer because of their consumption of processed meat remains small.” However, considering the large number of people who consume processed meat, it is of concern on a global basis.



加工肉類的例子,每份約重50克
Examples of processed meat, each weighs about 50g



大腸癌有多普遍？

本港衛生署的數據顯示，大腸癌是本港第二位最常見的癌症，亦在致命癌症中排第二位。

在二零一三年，大腸癌導致1 981人死亡。世衛報告指，大腸癌分別位居全球最常見的男性和女性癌症第三和第二位。在二零一二年，全球共有694 000人死於大腸癌。據世衛估計，全球有50 000宗和34 000宗癌症死亡分別與進食過量紅肉和加工肉類有關。

我們應否改變飲食習慣？

雖然已得出食用加工肉類和紅肉與大腸癌有關聯的結論，但世衛並沒有勸諭人們停止食用加工肉類或紅肉，因為這些食物含有豐富的蛋白質、維他命B、鐵和鋅。由於肉類具有營養價值，世衛建議我們應平衡食用肉類的風險和益處。世衛在聲明中再次確認二零零二年《膳食、營養與預防慢性疾病》報告中關於有節制地食用保藏的肉製品以減少患癌風險的建議。世衛專家將於二零一六年年年初會晤，利用最新的資料，從整體健康飲食的角度，檢討加工肉類和紅肉對人們健康的影響。

癌症與多種因素有關，包括少吃膳食纖維、多吃加工肉類和高脂肪食物的飲食習慣；缺少運動；肥胖和吸煙等。IARC的報告指，全球每人平均每天進食50至100克紅肉。而本港食用這類食物的人士則平均每天進食66克紅肉和33克加工肉類，與IARC所得的全球每人平均數據相若。

有證據顯示，食物中的維他命C、鈣、葉綠素和多酚等成分能抑制N-亞硝基化合物或其他致癌物質的形成。世衛建議，多吃蔬果、少吃加工肉類和紅肉是預防多種癌症的重要一環。

注意要點

- IARC把加工肉類歸類為“令人類致癌”物質；紅肉為“可能令人類致癌”的物質。
- 加工肉類和紅肉吃得愈多，患癌的風險愈高。
- 人們應避免進食過量加工肉類和紅肉，以減少患大腸癌的風險。

給業界的建議

1. 減少使用加工肉類。
2. 在配製肉類時，避免用會增加致癌物的烹煮方式，例如高溫、直接接觸火焰或長時間接觸高溫表面。

給市民的建議

1. 避免進食過量加工肉類和紅肉，以減少患大腸癌的風險。
2. 保持均衡及多元化飲食，包括多吃蔬果。
3. 少吃加工肉類亦有助減少攝取鈉（鹽），對健康有額外益處。

How Common is Colorectal Cancer?

Data from the Hong Kong Department of Health indicates that colorectal cancer is the second commonest cancer and the second leading cause of cancer deaths accounting for 1 981 deaths in 2013. Worldwide, the WHO reports that colorectal cancer is the third and second commonest cancer in men and in women respectively, causing a total of 694 000 deaths in 2012. WHO estimates that 50 000 and 34 000 of cancer deaths could be attributed to excessive intake of red meat and processed meat respectively.

Should We Change Our Eating Habits?

Even though the consumption of processed meat and red meat has been associated with colorectal cancer, the WHO is not advising people not to eat processed meat or red meat as these contain high value proteins, vitamin Bs, iron and zinc. The WHO has noted the nutrition benefits from meat and suggested that we shall balance the risks and benefits of meat consumption. The WHO statement has reconfirmed a recommendation from its 2002 “Diet, nutrition and the prevention of chronic diseases” report that people should moderate the consumption of preserved meat to reduce the risk of cancer. A WHO standing group of experts will meet in early 2016 to review the latest information on the public health impact of processed meat and red meat in the context of overall healthy diet.

Cancer is associated with many factors, including a diet low in dietary fibre and high in processed meat and fat, physical inactivity, obesity and smoking. Hong Kong people consume about 66g of red meat and 33g of processed meat per person daily on average among consumers of these products, which falls within the IARC’s reported world average red meat intake of 50 to 100 g/person/day.

There is evidence that certain components from food, e.g. vitamin C, calcium, chlorophylls, polyphenols, etc., can inhibit the formation of N-nitroso compounds or other cancer causing agents. As a major prevention strategy against many cancers, the WHO recommends eating more vegetables and fruits but less processed meat and red meat.

Key Points to Note

- The IARC has classified processed meat as carcinogenic to humans and red meat as probably carcinogenic to humans.
- The cancer risk increases with the amount of processed meat and red meat consumed.
- Avoid excessive consumption of processed meat and red meat to reduce colorectal cancer risk.

Advice to the Trade

1. Reduce the use of processed meat.
2. When preparing meat, try to avoid cooking methods that will increase carcinogen formation, e.g. high temperatures, and direct contact with flame or prolonged contact with a hot surface.

Advice to the Public

1. Avoid excessive consumption of processed meat and red meat to reduce colorectal cancer risk.
2. Maintain a balanced diet and consume a variety of food, including plenty of fruits and vegetables.
3. Reducing the consumption of processed meat can also help to reduce sodium (salt) intake, which brings additional health benefits.

風險傳達 工作一覽 Summary of Risk Communication Work

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淺談蠔的食物安全風險

Overview of Food Safety Risks of Oysters

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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聖誕節快要到了，打算吃生蠔慶祝一番？在你付諸行動之前，一定要了解清楚吃蠔的食物安全風險，以免在佳節當前置生大煞風景的插曲。

與蠔有關的危害

蠔在本質上比其他海產高危，原因是蠔以過濾方式進食，周圍環境中可能存在的病原體，包括病毒(例如諾如病毒和甲型肝炎病毒)和細菌(副溶血性弧菌和創傷弧菌)會在其體內積聚。即使專供生吃的蠔隻來自實施糞便污染控制的水域，也不代表完全沒有微生物風險。因此，進食生蠔或半生不熟的蠔較易受病原體感染。

除了病原體外，蠔隻受到重金屬污染的問題亦不容忽視。徹底煮熟蠔隻固然可消滅病原體，但卻不能去除蠔隻體內可能積聚的重金屬(例如鎘和鉛)和海洋生物毒素(例如麻痺性貝類毒素)。

病原體

蠔受諾如病毒和甲型肝炎病毒污染的途徑，主要是通過生長區或捕撈區人類糞便的污染。諾如病毒會令患者的胃及／或腸發炎，甲型肝炎病毒則會造成肝臟細胞發炎。這些病毒可以在受污染的活蠔體內存活數星期並可在其腸道中檢測到。雖然把蠔長期轉移到水質潔淨的水域中可以有效地消除病毒致病的風險，但此舉會產生額外成本。況且，受污染捕撈區附近可能缺少潔淨水域，故實際上往往並不可行。單靠淨化處理往往不足以消除這些病毒。一般的食物安全建議是把食物加熱至中心溫度達75°C並維持30秒，但對蠔來說，這個溫度未必能消除蠔體內的病毒。烹煮蠔時，應把蠔加熱至中心溫度達90°C並維持90秒。

除了病毒外，有大量記載顯示蠔也是傳播弧菌類疾病的元凶，特別是副溶血性弧菌和創傷弧菌。這些弧菌天然棲息於和暖的海水和河口，烹煮過程可輕易將之殺死。副溶血性弧菌可引致食物中毒症狀，如腹痛、腹瀉和嘔吐，有時會出現發燒，病情通常為輕微至一般。健康人士感染創傷弧菌，偶爾會引致腸胃炎症狀；但如感染的是長期病患者，尤其是肝病或酗酒人士、糖尿病、血色素沉着病和愛滋病患者，後果十分嚴重而且往往致命。

重金屬

捕撈自受污染水域的蠔可能積聚高含量的鎘和鉛等重金屬。雖然因進食受重金屬污染的蠔而引致急性中毒的情況並不多見，但長期大量攝取鎘和鉛可能分別會對腎臟健康和神經系統的發育帶來不良的影響。

海洋生物毒素

麻痺性貝類毒素由某些微藻類產生，是一組相關的天然毒素。在正常情況下，產毒藻類在海水中的數量是很低的，不足

Christmas is just around the corner; plan to have some raw oysters in this festive season? Before you really go for it, it is important to understand the food safety risks associated with oysters and don't let them ruin your holiday celebration.

Hazards Associated with Oysters

Oysters are inherently riskier than other seafood because of their filter feeding activity that concentrates pathogens, including viruses (e.g. norovirus and Hepatitis A virus) and bacteria (e.g. *Vibrio parahaemolyticus* and *Vibrio vulnificus*) that may be present in their surrounding environment. Even though oysters specifically intended for raw consumption are harvested from waters that are monitored for faecal contamination, they are not completely free from microbiological risk. Therefore consuming raw or partially cooked oysters is of relatively high risk for infection by pathogens.

In addition to pathogens, oysters contaminated with heavy metals cannot be ignored. Thorough cooking can indeed destroy pathogens of concern, but it cannot remove heavy metals (e.g. cadmium and lead) as well as marine biotoxins (e.g. paralytic shellfish poisoning (PSP) toxins) that may have accumulated in the oysters.

Pathogens

The major route of norovirus and hepatitis A virus contamination in oysters is via human faecal contamination in growing or harvesting areas. While norovirus causes inflammation of the stomach and/or intestines, hepatitis A virus results in inflammation of the liver cells. These viruses can persist in contaminated live oysters for weeks and can be detected in their guts. Even though long-term relay of oysters to clean environmental waters can be effective for eliminating the risk of illness from viruses, this is often not practical due to added costs and lack of clean areas near the contaminated harvest sites. In addition, depuration alone is often not adequate to eliminate these viruses. Besides, heat treatment usually recommended (i.e. cooking to an internal temperature of 75°C for 30 seconds) for food safety may not be adequate to eliminate viruses in oysters (cooking to an internal temperature of 90°C for 90 seconds is needed).

Apart from viruses, oysters are also well-documented vehicles for transmission of illnesses caused by *Vibrio* spp., especially *V. parahaemolyticus* and *V. vulnificus*. These species of *Vibrio* are naturally found in warm seawaters and estuaries but can readily be inactivated by cooking. *V. parahaemolyticus* infection is usually mild to moderate with food poisoning symptoms like abdominal pain, diarrhoea, vomiting and sometimes mild fever. For *V. vulnificus*, it occasionally causes mild gastroenteritis in healthy people but can result in a serious, often fatal, health threat to those with underlying chronic diseases,

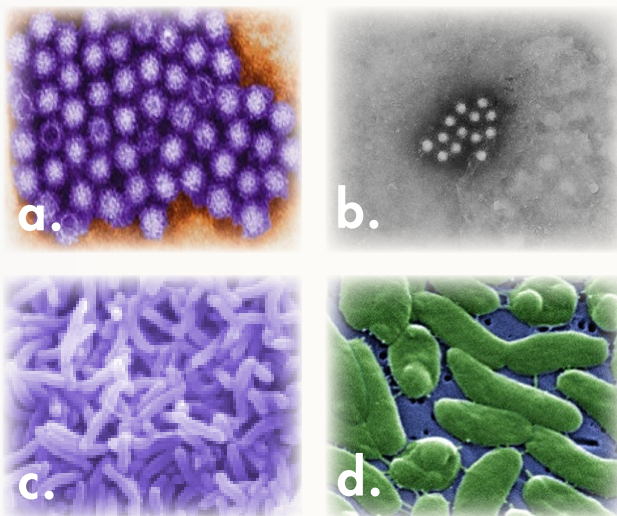
particularly liver disease or alcoholism, diabetes, haemochromatosis and HIV/AIDS.

Heavy Metals

High levels of heavy metals like cadmium and lead may also accumulate in oysters harvested from contaminated waters. Although acute toxicity resulting from consumption of contaminated oysters is uncommon, prolonged excessive intake of cadmium and lead may have adverse effects on the kidneys and neurodevelopment respectively.

Marine Biotoxins

PSP toxins are a group of related naturally occurring toxins produced by certain microscopic algae. It is normal when these algae are present at very



生蠔可能含有的病原體(a. 諾如病毒；b. 甲型肝炎病毒；c. 副溶血性弧菌；d. 創傷弧菌)(照片a和d來自美國疾病控制及預防中心；照片b來自美國公共衛生圖像庫；照片c 來自美國衛生與公眾服務部)

Pathogens (a. norovirus, b. hepatitis A virus, c. *V. parahaemolyticus*, d. *V. vulnificus*) that may be associated in raw oysters (Photos a and d courtesy of the U.S. Centers for Disease Control and Prevention; Photo b courtesy of the U.S. Public Health Image Library; and Photo c courtesy of the U.S. Department of Health and Human Services)

為患。但當這些藻類爆發性地大量繁殖，便會成為蠔的主要食糧，毒素會積聚在蠔的體內，特別是在內臟部分。麻痺性貝類毒素屬於神經毒素，毒性甚烈，嚴重者甚至會致命。現時並沒有已知的解毒劑。

給市民的建議

- 無論蠔是在哪個季節或水域捕撈，吃蠔(尤其是生蠔或未徹底煮熟的蠔)在本質上存在食物安全風險。
- 高風險人士(長者、幼童、孕婦和免疫力較弱的人)應避免進食生蠔。
- 為減低風險，無論是進食還是購買生蠔，都應光顧可靠的持牌店鋪。
- 切勿生吃只供熟食(即須烹煮)的蠔隻。
- 以下是一些烹煮蠔隻的貼士：煮3至5分鐘；炒至少3分鐘；或蒸4至9分鐘。

給業界的建議

- 蠔應購自可靠的供應商，並須附有原產地有關當局簽發的衛生證書。
- 出售生蠔須獲得食物環境衛生署署長的書面許可／批准。
- 採購在潔淨水域生長和捕撈的蠔。

low concentrations in the sea and poses no problems. However, when these algae "bloom", they will become a great food source for oysters and the toxins will be concentrated in oysters, particularly in the internal organs. PSP toxins are powerful nerve poisons with no known antidote and death can occur in severe cases.

Advice to the Public

- Regardless of the season or the region the oysters are harvested, consuming oysters, particularly raw or partially cooked ones, carries an inherent food safety risk.
- Susceptible populations (elderly, young children, pregnant women and people with weakened immune systems) should avoid eating raw oysters.
- To reduce risk, raw oysters should only be consumed in or obtained from reliable licensed premises.
- Never eat oysters raw that are intended for consumption after cooking.
- Some tips of cooking oysters: boil for 3-5 minutes, fry for at least 3 minutes; or steam for 4-9 minutes.

Advice to the Trade

- Obtain oysters from reliable sources with health certificates issued by the relevant authority of the exporting country.
- Get permission in writing/endorsement from the Director of Food and Environmental Hygiene prior to selling raw oysters.
- Source oysters that are grown in and harvested from areas of clean water.



帶食物探病？小心李斯特菌！

帶冷凍的即食食品給住院病人吃可能對病人不利。食物安全中心(中心)上月接獲衛生防護中心轉介的一宗李斯特菌病個案，患者之前曾進食家人購自外賣店的生海鮮壽司。

李斯特菌病主要是因食用受李斯特菌污染的食物引致，該種細菌可在一般烹煮溫度下輕易消滅，但能在冷藏低溫下生存和繁殖。初生嬰兒、長者和免疫力較低的人感染李斯特菌，可能出現嚴重的併發症如敗血症及腦膜炎，甚至死亡。孕婦感染李斯特菌可導致胎兒流產。

為減低感染李斯特菌病的風險，中心建議長期病患者、免疫力較低人士、孕婦、嬰兒和長者避免進食軟芝士、芝士蛋糕、凍食肉類、用生的食材配製的壽司、沙律、刺身及煙熏海鮮等高風險即食食品，因為這些食物長時間放在雪櫃裏，可滋生李斯特菌。

Bringing Food into Hospital? Watch Out for Listeria!

Bringing chilled ready-to-eat foods into hospital for patients to eat may put them at risk. Last month, the Centre for Health Protection notified the Centre for Food Safety (CFS) of a case of listeriosis involving an inpatient who had consumed sushi with raw seafood purchased by family members from a take-away shop.

Listeriosis is usually caused by eating food contaminated with *Listeria* which can be easily destroyed by cooking but can survive and multiply at refrigerator temperatures. Severe complications may occur, such as septicaemia, meningitis or even death in newborns, elderly and those with weaker immune systems; and miscarriages during pregnancy.

The CFS advises chronic disease patients, people with weaker immune systems, pregnant women, infants and the elderly to avoid eating high-risk foods, i.e. ready-to-eat foods that may have been stored in refrigerator for a long time allowing the growth of *Listeria*. These foods include soft cheese, cheese cakes, cold-cuts, sashimi, sushi with raw ingredients, salads, smoked seafood, etc.

櫻桃拔蘭地含可能令人類患癌的物質

食物安全中心(中心)上月接獲歐洲聯盟委員會食品和飼料快速預警系統(預警系統)的通報，指有法國酒精飲品被檢出含高分量的氨基甲酸乙酯。中心已聯絡預警系統資料顯示的本港進口商，得悉名為Kirsh的涉事產品並沒有流出市面。為謹慎起見，中心向業界和市民發布了有關事件的**食物警報**。

氨基甲酸乙酯是發酵食物和酒精飲品在發酵或貯存過程中天然產生的污染物。國際癌症研究機構把氨基甲酸乙酯列為“可能令人類患癌的物質”(第2A組)。在眾多酒精飲品中，水果拔蘭地和烈酒的氨基甲酸乙酯含量一般較高，而啤酒的含量則偏低。

酒精飲品被國際癌症研究機構列為“令人類致癌”(第1組)的物質。中心呼籲沒有飲酒習慣的人士不要開始飲酒；至於已養成飲酒習慣的人士，則應考慮減少飲酒或戒酒。業界在運送和貯存酒精飲品時，應盡量避免飲品暴露在高溫和強光下，以減少酒精飲品的氨基甲酸乙酯含量。

Probable Human Carcinogen in Cherry Brandy

Last month, the Centre for Food Safety (CFS) received a recall notification from the Rapid Alert System for Food and Feed (RASFF) of the European Commission about some French alcoholic beverages containing high levels of ethyl carbamate (EC). The CFS was informed by the Hong Kong importer implicated by RASFF that the products (cherry brandy, Kirsch or Kirschwasser) did not enter the local market. For prudence sake, the CFS has issued trade and **public alerts** of the incident.

EC occurs naturally during the fermentation and storage of alcoholic beverages and fermented foods. The International Agency for Research on Cancer (IARC) has classified EC as Group 2A "probably carcinogenic to humans". Among various alcoholic beverages, fruit brandy and distilled spirits usually contain higher amounts of EC while beers contain lower levels.

As **alcoholic beverages** are classified as Group 1 "carcinogenic to humans" by IARC, the CFS urges non-drinkers not to start drinking and current drinkers to consider cutting down on or even stopping drinking completely. Traders are advised to minimise heat and light exposure during transportation and storage of alcoholic beverages to reduce their EC levels.