

食物安全焦點

Food Safety Focus



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焦點個案 Incident in Focus

淡水魚生中的中華肝吸蟲 *Clonorchis sinensis* in Raw Freshwater Fish

食物安全中心
風險評估組
科學主任莊梓傑博士報告
Reported by Dr. Ken CHONG, Scientific Officer,
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本港傳媒在九月初報道過，在深圳與吃生或未經徹底煮熟的淡水魚有關的中華肝吸蟲感染率偏高一事。中華肝吸蟲是一種食源性寄生蟲，繼本刊早前探討這類寄生蟲後，現再作深入論述這種蟲。

傳播途徑與人類感染

中華肝吸蟲靠淡水池塘內的螺和魚傳播。人類或豬等其他受感染的哺乳類動物排出的蟲卵被淡水螺吃下，然後在其體內發育成為自由浮游形態(即尾動幼蟲)。尾動幼蟲在池塘內與魚皮接觸後會成為包囊形態，稱為囊狀幼蟲。人們吃下受感染的淡水魚後，囊狀幼蟲會在十二指腸破囊而出，遷移到肝臟內的膽管。囊狀幼蟲會在膽管內發育成蟲，然後產下蟲卵，蟲卵可隨膽汁進入糞便，繼續傳播周期。

感染小量中華肝吸蟲可全無症狀或只出現輕微症狀，但感染大量中華肝吸蟲則會令患者受到長期嚴重感染，引致食慾不振、腹瀉和發燒。此外，中華肝吸蟲亦會造成膽管梗阻和肝硬化，嚴重者可造成慢性黃疸，繼而較容易出現膽管癌(由膽管細胞引致的癌症)。國際癌症研究機構最近把中華肝吸蟲列為“會令人患癌”(第一組)。

流行情況

中華肝吸蟲感染盛行於內地、台灣、韓國及東南亞國家和地區。根據粗略估計，本港的腸道寄生蟲感染個案逾八成是由中華肝吸蟲所致。吃下含有囊狀幼蟲的生或未經徹底煮熟的淡水魚會令人感染中華肝吸蟲。超過100種淡水魚可感染到中華肝吸蟲，當中主要為鯉科魚類，例如鯪魚(草魚)及大頭(花鰱或鱮魚)。有報告指，個別流行地區感染率偏高(逾八成)是由鯪魚所致。進食含有生、未經徹底煮熟、鹽漬、醃製或煙燻淡水魚的菜式可能會引致這種風土疾病。我們難以分辨出淡水魚是否感染了中華肝吸蟲，亦無法用肉眼看見可傳播中華肝吸蟲的細小囊狀幼蟲。另一方面，有些淡水蝦亦會是這種吸蟲的第二

Local media reported in early September the high prevalence of *Clonorchis sinensis* infection in Shenzhen, notably associated with consumption of raw or undercooked freshwater fish. *Clonorchis sinensis*, also known as Chinese or oriental liver fluke, is a type of foodborne parasites that were discussed earlier in this journal. Here we go further to look at this fluke more closely.

Transmission and Human Infection

Transmission of the fluke relies on the presence of snails and fish in freshwater ponds. Eggs excreted from humans or other infected mammals, e.g. pigs, are ingested by snails and developed into the free-swimming form (i.e., cercariae). The cercariae in the pond will get into contact with the fish skin and changed into an encysted form called metacercariae. When humans eat the infected fish, the metacercariae will come out from the cyst while in the duodenum and migrate to the biliary duct in the liver. They will get mature in the biliary duct and start to form eggs that can pass with bile into faeces and continue the transmission cycle.

Light infections by the fluke cause mild or no symptoms, while large numbers can cause intense infection for long duration and result in loss of appetite, diarrhoea, and fever. The fluke can also cause obstruction of the bile duct and liver cirrhosis. In severe cases, the infection can result in chronic jaundice and eventually the higher occurrence of cholangiocarcinoma (cancer arising from bile duct cells). *Clonorchis sinensis* is recently classified as "carcinogenic to humans" (Group 1).

Epidemiology

Infection of *Clonorchis sinensis* is endemic in Mainland China, Taiwan, Korea and some other countries and areas in Southeast Asia. It is roughly estimated that *Clonorchis sinensis* contributes to more than 80% of local human cases of enteric parasites. People are infected by consuming raw or undercooked freshwater fish containing metacercariae. More than 100 species of freshwater fish, mainly carp, e.g. grass carp and big head carp, can be affected by the fluke. High prevalence rate, up to more than 80%, was reported in grass carp in certain endemic regions. Dishes with freshwater fish eaten raw, undercooked, salted, pickled, or smoked may contribute to endemicity. One can hardly distinguish the affected fish or identify the infective metacercariae as they are too small for naked eyes. On the other hand, some freshwater shrimps can serve as second intermediate hosts for this fluke, but there is lack of epidemiological evidence on their association with human

焦點個案
Incident in Focus

中間宿主，但目前並無流行病學證據證明牠們會令人感染中華肝吸蟲。

除了人類外，貓、狗、豬及數種以魚類為食物的哺乳類動物亦會感染中華肝吸蟲。有些地區可能會以死去的淡水魚來餵飼動物，其體內的囊狀幼蟲便會因而傳播給這些動物。人或動物的糞便可令蟲卵散播到環境和水中，例如，用作肥料，又或如部分鄉村水產養殖區等把廁所建於魚塘上。

預防之道

切勿吃生或未經徹底煮熟的淡水魚。在本港傳統中式魚生(即供生吃的淡水魚)已被禁售超過30年，但是大家緊記在外遊時亦不應進食的淡水魚。酒、醋、日式芥辣、黃芥辣及香料均不能殺死包括中華肝吸蟲在內的寄生蟲。如用作火鍋及粥品等食物配料時，又或魚片切得太厚時，雖特別注意淡水魚會否煮不熟。



鯪魚(上)及大頭(下)等淡水魚應徹底煮熟才進食。

Freshwater fish, such as grass carp (above) and big head carp (below), should be cooked thoroughly before consumption.

infections.

Apart from humans, cats, dogs, pigs and several other fish eating mammals are also susceptible to the infection. Dead freshwater fish may be used to feed animals in some regions and the metacercariae present can then be transmitted to these animals. Faeces from humans or animals can help to disperse the eggs in the environment and water bodies, e.g. when the faeces are used as fertiliser or when toilets are built over fishponds in some rural aquaculture areas.

Prevention

Do not eat raw or undercooked freshwater fish. The ancient practice of eating Chinese Yu Sang (i.e. freshwater fish intended for raw consumption) has been prohibited for sale in Hong Kong for more than 30 years. One should also avoid such dish while travelling. Wine, vinegar, wasabi, mustard and spices cannot destroy parasites including the fluke. In particular, freshwater fish may be undercooked in some cases, such as during hotpot and congee cooking, or when the fish slices are too thick.

注意要點：

1. 中華肝吸蟲是淡水魚的已知風險因素。
2. 中華肝吸蟲可令肝臟的膽管梗阻、發炎和出現癌症。
3. 進食生或未經徹底煮熟的淡水魚，尤其是鯉科魚類，是感染中華肝吸蟲的主因。

Key Points to Note:

1. Liver fluke, *Clonorchis sinensis*, is a known hazard associated with freshwater fish.
2. *Clonorchis sinensis* can cause obstruction, inflammation and cancer of the biliary ducts in the liver.
3. Eating raw or undercooked freshwater fish, especially carp, is the main cause of infection.

給消費者的建議

- 不應吃生或未經徹底煮熟的淡水魚。
- 消費者應確保淡水魚徹底煮熟，特別是火鍋或粥品中的淡水魚。
- 使用專門用具分開處理生的食物和即食食物，以防交叉感染。

Advice to Consumers

- Do not consume raw or undercooked freshwater fish.
- Ensure freshwater fish is adequately cooked, especially during hotpot or congee cooking.
- Always use separate utensils for handling raw food and ready-to-eat food to avoid cross contamination.

給業界的建議

- 本港禁售中式魚生(淡水魚魚生)，業界不得向消費者供應中式魚生。
- 使用專門用具分開處理生的食物和即食食物，以防交叉感染。
- 把生的淡水魚切成薄片，以便徹底煮熟火鍋和粥品中的魚片。
- 養魚戶應奉行良好水產養殖管理方案，切勿使用受家居或禽畜廢水污染的水道，並採用食物安全重點控制系統控制水產養殖活動受寄生蟲污染的風險。

Advice to the Trade

- Chinese Yu Sang (raw freshwater fish) is prohibited for sale in Hong Kong. Do not supply Chinese Yu Sang for consumers.
- Use separate utensils to handle raw food and ready-to-eat food to prevent cross-contamination.
- Cut raw freshwater fish into thin slices to facilitate thorough cooking during hotpot and congee cooking.
- Fish farmers should adopt Good Aquaculture Practice and do not use waterway that is contaminated by domestic or livestock sewage. Apply Hazard Analysis Critical Control Point (HACCP) system to control the risk of contamination of fish culture by parasites.

揭開防腐劑的神秘面紗

Breaking the Mythical Preservatives' Code

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

“防腐劑”一詞往往帶負面色彩，令人以為是有害或可致病的東西。今期我們將為大家揭開硝酸鹽／亞硝酸鹽、亞硫酸鹽及對羥基苯甲酸酯這三種在食物中常見物質的神秘面紗。

硝酸鹽及亞硝酸鹽會否致癌？

硝酸鹽天然存在於環境四周及植物，是植物(包括蔬菜)生長的必需營養素。我們從飲食中攝入的硝酸鹽主要來自蔬菜。另一方面，亞硝酸鹽則大多數由硝酸鹽經細菌或酶作用轉化而成。

硝酸鹽及亞硝酸鹽能有效抑制各種細菌，包括肉毒桿菌。肉毒桿菌屬於厭氧菌，能產生可引致肉毒中毒的毒素。肉毒中毒是一種急性的嚴重神經系統疾病，可造成癱瘓甚至死亡。基於技術需要，在本港硝酸鹽及亞硝酸鹽只准許在部分加工肉類和芝士中用作防腐劑。

在食物中使用硝酸鹽及亞硝酸鹽的主要關注，是由於它們有機會轉化為一些可能致癌的物質。有研究顯示，人們攝入這些轉化的物質的總量只有小部分是來自加工肉類及芝士中的硝酸鹽及亞硝酸鹽，停止進食添加了硝酸鹽及亞硝酸鹽的上述兩類食物不會對患癌風險有顯著影響。因此，使用這兩種防腐劑能有效防止肉毒中毒的優點大於其可能引致的風險。此外，食物如使用硝酸鹽及亞硝酸鹽這兩種防腐劑，往往同時加入抗壞血酸(維他命C)或異抗壞血酸，因為它們能有效預防硝酸鹽及亞硝酸鹽的上述轉化。

亞硫酸鹽會否引發哮喘？

亞硫酸鹽是一組天然存在於人體和部分食物中的化學物。亞硫酸鹽在葡萄酒天然存在，亦會在發酵前的釀酒過程中添加，以殺死可影響質量的微生物。此外，亞硫酸鹽亦會經常添加在乾果、醃菜及香腸中作為防腐劑。

亞硫酸鹽對大部分人是安全的。不過，有部分人對亞硫酸鹽過敏並多同時患有哮喘，他們可能會在進食含亞硫酸鹽的食物後出現過敏症狀，包括哮喘發作。

如你對亞硫酸鹽過敏，避免出現過敏反應的唯一方法是仔細閱讀食物標籤，戒絕一切含有亞硫酸鹽的食物。法例規定，如食物由濃度達到或超過百萬分之十的亞硫酸鹽組成或含有上述濃度的亞硫酸鹽，有關的亞硫酸鹽的作用類別(例如防腐劑)及其名稱須在配料表中指明。由於亞硫酸鹽用作食物添加劑時，可能會以不同的化學名稱表達，故此你須留意以下名稱：二氧化硫、亞硫酸鈉／亞硫酸鉀／亞硫酸鈣、亞硫酸氫鈉／亞硫酸氫鈣、焦亞硫酸鈉／焦亞硫酸鉀、亞硫酸氫鉀、硫代硫酸鈉及亞硫酸。

對羥基苯甲酸酯是否具有生殖毒性？

對羥基苯甲酸酯是一組苯甲酸衍生物，天然存在於藍莓、梅子及玉桂中。此外，亦可在辣椒醬及蝦醬等多種食物中用作防腐劑，抑制酵母菌及霉菌。

The term “preservatives” is often linked to a negative image and considered something undesirable or disease causing. In this issue, let's decode some mythical substances i.e. nitrates/ nitrites, sulphites and parabens which are commonly used in our foods.

Do Nitrates and Nitrites Cause Cancers?

Nitrates occur naturally in the environment and plants. They are essential nutrients for plants including vegetables to grow. Our dietary exposure to nitrates is mainly through the consumption of vegetables. Nitrites, on the other hand, are mostly converted from nitrates by bacteria or enzymatic actions.

Nitrates and nitrites are good at inhibiting various bacteria, including the anaerobic *Clostridium botulinum*. This bacterium can produce toxin, causing acute and severe botulism, a neurologic illness with paralysis and even death. Due to the technological needs, both are only permitted in some processed meats and cheeses as preservatives locally.



硝酸鹽／亞硝酸鹽是芝士及火腿常用的准許防腐劑，而酒類則常有亞硫酸鹽
Nitrates and nitrites are commonly used permitted preservatives in cheese and ham, while sulphites are often found in wine

One main concern about the use of nitrates and nitrites is that they may be converted to some substances which are probably carcinogenic. Studies have shown that nitrates and nitrites used in processed meats and cheeses only accounted for a small proportion of the total exposure to these converted substances and eliminating them would not have a major effect on the cancer risk. Therefore, the benefit of using these effective preservatives to prevent botulism outweighs the risks. In addition, food preserved with nitrates and nitrites are often added together with ascorbates (vitamin C) or isoascorbates, which can effectively prevent the conversion mentioned above.

Do Sulphites Initiate Asthma?

Sulphites are a group of chemicals which naturally occur in our body as well as some of our foods. While occurring naturally in wines, sulphites are also added during wine making prior to fermentation to eliminate interfering microorganisms. They are also commonly added to dried fruits, pickled vegetables and sausages as preservatives.

Sulphites are safe for most of us. However, some sulphite-sensitive people, many of whom also have asthma, may develop allergic symptoms including asthmatic attacks when they eat food containing sulphites.

If you are sensitive to sulphites, the only way to stay away from a reaction is to avoid all sulphite-containing foods by reading food labels carefully. As required by law, if a food consists of or contains sulphite in a concentration of 10 ppm or more, the functional class e.g. preservative of the sulphite and its name shall be specified in the ingredient list. As sulphites may be presented in various chemical names when used as food additives, you have to watch out for these names i.e. sulphur dioxide, sodium/ potassium/ calcium sulphite, sodium/ calcium hydrogen sulphite, sodium/ potassium metabisulphite, potassium bisulphite, sodium thiosulphate and sulphurous acid.

Do Parabens Give Rise to Reproductive Toxicity?

The term “parabens” is the common name for a group of benzoic acid derivatives - esters of para-hydroxybenzoic acid. Parabens occur naturally in blueberries, prunes and cinnamon. They are also used as preservatives to inhibit yeasts and moulds in various foods such as chilli sauces and shrimp paste.

There are many subtypes of parabens depending on the number of additional carbon chain attached. One type, the propyl paraben, has recently been found to cause undesirable reproductive effects on male rats. In view of this finding, propyl paraben has been taken out from the permitted

對羥基苯甲酸酯可按連接的額外碳鏈數目劃分為許多種，其中其丙酯近年證實會損害雄性大鼠的生殖能力。基於有關研究結果，對羥基苯甲酸丙酯已從准許防腐劑名單上剔除，不得再用於所有本港食物中。至於其他種類的對羥基苯甲酸酯類(即甲酯及乙酯)，由於不會產生上述不良影響，故可在本港繼續用於涼果及汽水等食物中。

從硝酸鹽／亞硝酸鹽、亞硫酸鹽及對羥基苯甲酸酯的個別特點可見，正確運用防腐劑絕少會對一般人的健康造成影響。不過，大家應時刻保持均衡飲食，以免過量進食某種食物或從某種食物中過量攝入某些食物添加劑。

我們將會在下一期探討另一種可延長食物保質期的食物添加劑 — 抗氧化劑。

preservative list and is no longer allowed in all foods in Hong Kong. Some other types of parabens i.e. methyl and ethyl ones which do not have such undesirable effect are continued to be allowed for use in foods including preserved fruits and soft drinks locally.

The unique features of nitrates/ nitrites, sulphites and parabens show that adverse health effects resulting from proper use of preservatives are very unlikely in the general population. Nonetheless, having a balanced diet to avoid excessive exposure to any food types or additives from any specific food item is always advisable.

In the next issue, let's move on to another food additive that can extend the life of food – antioxidant.

食物事故點滴
Food Incident Highlight

嬰兒配方奶粉中的阪崎氏腸桿菌

食物安全中心從本港市面上抽取100個樣本進行有關嬰兒配方奶粉中的阪崎氏腸桿菌含量情況的調查，結果全部合格，沒有樣本驗出阪崎氏腸桿菌。

阪崎氏腸桿菌這種致病菌可能會令免疫力較弱的人(包括初生和早產嬰兒)患上嚴重疾病，例如敗血症及腦部感染。阪崎氏腸桿菌是存在於環境中的一種生物，常見於生產嬰兒配方奶粉的設施和家居環境中。有外國報告指，嬰兒配方奶粉是阪崎氏腸桿菌的來源和傳播媒介。

世界衛生組織建議，嬰兒在出生後首6個月，應只以母乳餵哺。照顧嬰兒的人應使用攝氏70度或以上的熱水安全沖調嬰兒配方奶粉。沖調好的奶如非即時飲用，應冷卻和貯存在雪櫃內，並在配製後24小時內飲用。

Enterobacter sakazakii in Powdered Infant Formula

The Centre for Food Safety conducted a project on *Enterobacter sakazakii* in powdered infant formula (PIF), which collected 100 samples from the local market. All results were satisfactory with no *E. sakazakii* detected.

Enterobacter sakazakii is a pathogen which may cause serious diseases, such as bacteria in blood and brain infection, in people with weakened immune systems including neonates and pre-term infants. *E. sakazakii* is considered to be an environmental organism and is likely to be present in manufacturing facilities and domestic situations. Overseas reports have indicated that PIF is the source and vehicle of infection.

The World Health Organization recommends exclusive breastfeeding for infants in their first six months of life. Caregivers are advised to safely prepare PIF by reconstituting PIF with water at 70°C or above. If not used immediately, prepared PIF should be cooled and stored in the refrigerator, and used within 24 hours of preparation.

草酸洗蟹?!

傳媒在上月報道，部分內地不法商人使用草酸洗蟹，以偽冒為大閘蟹。食物安全中心立即從市面上抽取大閘蟹樣本進行草酸測試，13個樣本的測試結果全部合格。

進食含有大量草酸的食物可引致食物中毒，患者會出現胃部不適、鈣水平偏低、神經系統及腎臟受損等症狀。

草酸不得加入蟹中。業界應從註冊大閘蟹場進口附有衛生證明書的大閘蟹，向可靠的供應商採購大閘蟹，並把待售的大閘蟹妥善存放在雪櫃內。消費者應光顧可靠、衛生的店鋪，並選購外殼完整、有光澤和沒有異味的活生大閘蟹。大家必須徹底清洗和煮熟這種時令美食才享用，並切記不要多吃這種高膽固醇食物。

Oxalic Acid in Crab Wash?!

Last month, the media reported that some unscrupulous traders in Mainland China used oxalic acid to wash crabs to make them look like hairy crabs. The Centre for Food Safety immediately conducted testing for oxalic acid on hairy crab samples from the market. Thirteen samples were tested. The results were all satisfactory.

Consumption of food containing high levels of oxalic acid can cause food poisoning. Symptoms of stomach irritation, lowered calcium levels, adverse effects to the nervous system and kidney can occur.

Oxalic acid should not be added to crabs. Traders should import hairy crabs with health certificates from registered farms, source them from reliable suppliers and keep them properly in the refrigerator for sale. Consumers are advised to patronise reliable and hygienic shops and buy live hairy crabs with intact, shiny shells without a foul smell. To enjoy this seasonal delicacy, always clean and cook them thoroughly and remember not to overindulge in this cholesterol-rich food.

風險傳達
工作一覽
Summary of
Risk Communication Work

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