

本期內容 IN THIS ISSUE

焦點個案

奶類中的性激素

風險傳達工作一覽

食物安全平台

防腐劑 — 對付食物內微生物的有效武器

食物事故點滴

有殼雞蛋中的沙門氏菌
內地小龍蝦與橫紋肌溶解症

Incident in Focus

Sex Hormones in Milk

Summary of Risk Communication Work

Food Safety Platform

Preservatives - A Powerful Weapon to Combat Microorganisms in Our Foods

Food Incident Highlight

Salmonella in Shell Eggs
Crayfish and Rhabdomyolysis in the Mainland

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焦點個案 Incident in Focus

奶類中的性激素

Sex Hormones in Milk

食物安全中心

風險評估組

科學主任林漢基博士報告

Reported by Dr. John LUM, Scientific Officer,

Risk Assessment Section,

Centre for Food Safety

今年八月七日，本港傳媒指內地出售的某牌子奶粉據稱在湖北省導致多名四至十五個月大的女嬰出現乳房增大及其他青春發育（即早熟）特徵。內地衛生部成立專家組調查事件。八月十五日，衛生部公布檢測結果，指有關奶粉的雌激素及黃體酮含量與正常的牛奶相若，亦無在奶粉中發現內地禁用的激素。衛生部總結指事件中的女嬰乳房增大情況與飲用該奶粉無關。本文旨在探討奶類中的性激素問題。

性激素與奶類

激素是人類和生物體內自行製造的化學物，對成長發育、生育甚至情緒均會產生或造成影響。性激素是控制性成熟和生育的一組重要激素。女性體內的雌激素及黃體酮和男性的睪丸素是最重要的天然（又稱為內源性）性激素。

牛奶本身含有天然雌性激素。在商業牛奶場的一般運作中，大部分乳牛在產下小牛後很快又再懷孕。乳牛懷孕時體內會分泌出較多雌激素及黃體酮，以致所產的牛奶可能含有相當分量的雌激素及黃體酮。

對公眾健康影響較大的性激素是外源性性激素，即由實驗室製造與天然性激素功能相若的化學物。這類性激素通常用於動物或人體內作醫學或其他用途，例如外源性性激素有時會用來刺激排卵，有助懷孕。不過，良好的飼養規範應確保乳牛在接受注射外源性性激素後短期內所產的牛奶不會用於商業用途。由於部分外源性性激素已知可令人類致癌，國際當局一般會嚴格管制甚至禁止食物中出現這些外源性性激素。

On 7 August 2010, local media reported that a brand of infant formula sold in the Mainland had allegedly caused breast enlargement and other signs of puberty (ie, precocious puberty) in female infants aged between 4 and 15 months in Hubei province. The Mainland Ministry of Health (MOH) set up a taskforce to investigate the incident.

On 15 August 2010, the MOH announced the test findings, which revealed that the alleged milk contained estrogen and progesterone at levels normally present in milk while hormones that were prohibited in the Mainland were not found. MOH concluded that the reported early development of breast in the infants was not related to the consumption of the alleged infant formula. This article discusses the issue of sex hormones in milk.



乳牛 Dairy Cow

Sex Hormones and Milk

Hormones are chemicals produced by humans and living organisms to direct or exert effects on growth, reproduction and even mood. Sex hormones are an important group of hormones for controlling sexual maturity and reproduction. Estrogen and progesterone in females and testosterone in males are the most important naturally occurring, or endogenous, sex hormones.

It has been known that cow's milk contains the natural female sex hormones. In commercial dairy operations, a high percentage of the milk-producing cows are pregnant shortly after giving birth to the previous calf. The pregnancy status causes them to secrete higher levels of estrogen and progesterone and hence the resulting milk produced may contain considerable amount of such hormones.

Of greater public health concerns are exogenous sex hormones, ie, chemicals manufactured in laboratories that mimic functions of naturally occurring sex hormones. They are usually given to animals or humans for certain medical or other purposes. For instance, exogenous sex hormones may sometimes be used for induction of ovulation to facilitate pregnancy. Nonetheless, a good husbandry practice should ensure that milk produced shortly after

焦點個案
Incident in Focus

本港對奶類中性激素的規管

本港食物法例禁止出售不宜供人食用的食物。《食物內有害物質規例》(第132AF章)明確禁止魚類、肉類或奶類含有乙二烯雌酚、乙二基已烯雌酚及已烷雌酚(包括其鹽及酯化合物)這三種外源性激素。

食物安全中心(中心)設有恆常食物監察計劃,在進口、批發和零售層面抽取食物樣本進行激素測試,食物樣本包括野味、肉類、家禽、奶類及奶製品、魚類、蝦、蟹及貝類水產等。自二零零七年至今,抽取樣本全部測試合格。因應近日內地發生的事件,中心額外抽取奶粉樣本進行測試,並未發現含有違禁性激素,而樣本內所含的天然激素水平亦屬滿意。

注意要點

- 雌激素及黃體酮是天然雌性激素,可存在於牛奶中。
- 食物中不可含有對健康會造成影響的性激素。
- 過去幾年有關性激素的食物監察結果滿意。

給消費者的建議

1. 青春期的乳房增大情況(又稱乳房早熟)可發生在嬰幼兒身上,若沒有其他早熟跡象,大部分約在兩歲後回復正常。然而,嬰幼兒如出現這些徵狀,應儘快求醫。
2. 消費者應保持均衡飲食,避免偏食。
3. 光顧可靠的食物業處所及食物零售商。

給業界的建議

1. 業界應確保出售或進口的食物適宜供人食用,並符合法例標準。
2. 向可靠來源採購食品。

injection of exogenous hormones will not be used for commercial use. As some exogenous hormones are found to be carcinogenic to humans, international authorities usually exercise strict control or even prohibition on the occurrence of such exogenous hormones in foods.

Regulatory Control of Sex Hormones in Milk in Hong Kong

The local food law prevents the selling of food unfit for human consumption. The Harmful Substances in Food Regulations (Cap 132AF) prohibit the occurrence of three exogenous hormones, namely dienoestrol, diethylstilboestrol or hexoestrol, including salts and esters thereof, in any fish, meat or milk.

The Centre for Food Safety (CFS) has put in place a regular Food Surveillance Programme for testing hormones in food samples taken at the import, wholesale and retail levels. Food items covered included game, meat, poultry, milk and dairy products, fishes, crabs, shrimps and shellfish, etc. Results of all samples taken since 2007 were satisfactory. In response to the recent Mainland incident, the CFS tested additional samples of milk powder and did not find any prohibited sex hormones. The levels of natural hormones found in the samples were within satisfactory limits.

Key Points to Note

- Estrogen and progesterone are naturally occurring female sex hormones and are found in cow's milk.
- Sex hormones of health concerns are prohibited in food.
- Food surveillance in relation to sex hormones in food was satisfactory over the past years.

Advice to Consumers:

1. Breast enlargement before usual pubertal age (or premature thelarche) may occur in infants, and many of those without other signs of early puberty may return to normal after age of two. Nonetheless, one should seek medical attention as soon as possible if such signs occur.
2. Consumers are advised to take a balanced diet and to avoid overindulgence of food items.
3. Patronise reliable food premises and food retailers.

Advice to Trade

1. The trade should ensure the foods they sell or import are fit for human consumption and comply with legal standards.
2. Obtain food products from reliable sources.

風險傳達
工作一覽
Summary of
Risk Communication Work

風險傳達工作一覽(二零一零年八月) Summary of Risk Communication Work (August 2010)	數目 Number
事故/食物安全個案 Incidents / Food Safety Cases	63
公眾查詢 Public Enquiries	95
業界查詢 Trade Enquiries	362
食物投訴 Food Complaints	362
給業界的快速警報 Rapid Alerts to Trade	39
給消費者的食物警報 Food Alerts to Consumers	1
教育研討會/演講/講座/輔導 Educational Seminars / Lectures / Talks / Counselling	86
上載到食物安全中心網頁的新訊息 New Messages Put on the CFS Website	20

防腐劑 — 對付食物內微生物的有效武器

Preservatives - A Powerful Weapon to Combat Microorganisms in Our Foods

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

沒有人會想吃發霉麪包做早餐。我們能避免麪包發霉嗎？每天早上到麪包店買新鮮麪包？大家可能會覺得這樣做有點不方便。把麪包放在雪櫃又如何？嗯.....麪包就會失去原來風味。如果想把麪包放在室溫下較長時間而不發霉的話，選擇加入防腐劑的麪包也許是不錯的主意！

食物內的有效工具

防腐劑屬於食物添加劑，在食物安全和品質上具有重要功能，可防止由酵母菌、霉菌及細菌等微生物引致的腐壞。如果沒有防腐劑，許多食物便會因變壞而造成浪費，更別說可能會因此引致許多食物中毒個案。

保質期較長的加工處理食物通常含有防腐劑，其他可能已採用巴士德消毒法、冷凍、冷藏、製乾及入罐等其他防腐技術，把食物好好保存。

當大家知道日常食物中有多少是含有防腐劑，可能會大吃一驚。芝士三文治早餐、火腿即食麪午餐、乾果小吃、燻魚晚餐，可能全都加入了防腐劑。

No one would like to have a piece of mouldy bread for breakfast. Can we avoid mouldy bread? Buying fresh bread from bakery every morning? You may think it is a bit inconvenient. How about keeping them in the fridge? Um..... the bread will become stale! Perhaps, choosing those with preservatives would not be a bad idea if you want to keep bread free from mould longer at room temperature.

A Powerful Tool in Food

Preservatives are food additives which play a crucial role in food safety and quality by protecting against deterioration caused by microorganisms including yeasts, moulds and bacteria. Without preservatives, many foods would be spoiled and wasted, not to mention the possibility of many potential food poisoning cases so caused.

Any processed food with a relatively long shelf-life is likely to contain preservatives, some may have used other preservation techniques such as pasteurisation, chilling, freezing, drying and canning.

You may be surprised by the number of foods you commonly eat that contain preservatives. Sandwiches with cheese for breakfast, instant noodles with ham for lunch, dried fruits for snack and smoked fish for dinner may all contain preservatives.



加入了防腐劑的各式食物，包括(a)乾果（提子乾、芒果乾及話梅）、(b)芝士及(c)火腿。
Examples of food containing preservatives – (a) dried fruits (raisin, dried mango and dried plum), (b) cheese and (c) ham

大家無須擔心！食物防腐劑受規管

本港准許使用的防腐劑均確定為安全。每種防腐劑只限用於指明食物中，而且只應添加發揮技術用途所需的最低分量，更不得超過最高准許使用量。此舉確保市民從各種食物中攝入某一准許防腐劑的分量不會超出每日可攝入量。然而，大家保持均衡飲食，就不會因偏吃而過量攝入化學物。

此外，如有其他在經濟和技術上可行的方法達到防腐目的，業界便不得在食物中使用防腐劑。舉例來說，大家會發現市面出售的牛奶均不含防腐劑，因為業界可使用巴士德消毒法及超高溫法等其他技術好好保存牛奶，故不得在牛奶中使用防腐劑。

食物安全中心通過食物監察計劃定期監察食物內防腐劑的使用情況。

新增的准許防腐劑

在本港的准許防腐劑中，有些會較廣泛應用於食物中。最有效和最廣泛應用的防腐劑是酸性防腐劑，可提供微生物無法在食物中繁殖的條件。例子包括一些弱性有機酸（例如苯甲酸、對羥基苯甲酸酯類、

No Worries! Food Preservatives are Under Control

Preservatives permitted for use in Hong Kong have been determined to be safe. Each is only permitted in specific food groups with the lowest possible level necessary to achieve their technological effect and not exceeding the maximum permitted level. This ensures the intake of a permitted preservative from all its uses does not exceed its acceptable daily intake. Nonetheless, having a balanced diet can always keep one safe from excessive exposure to any particular chemical.

In addition, no preservatives are allowed in food if such purpose can be achieved by other means which are economically and technologically practicable. For example, you will not find any milk containing preservatives on shelf. Such use is not allowed as other techniques, e.g., pasteurisation and ultra high temperature treatment, can preserve it well.

The Centre for Food Safety monitors the use of preservatives in foods regularly under its Food Surveillance Programme.

Newly Permitted Preservatives

Among the locally permitted preservatives, some have wider applications than the others. The most effective and widely used preservatives are acidic in nature, providing an environment that microorganisms are unable to grow in the food. Examples are some weak organic acids such as benzoic acid, alkyl esters of para-hydroxybenzoic acid (also known as parabens), sorbic acid and propionic acid as well as the inorganic ones such as sulphites or nitrites.

山梨酸和丙酸) 及一些無機酸 (例如亞硫酸鹽類和亞硝酸鹽類)。

為使本港食物法例與國際發展一致,《食物內防腐劑規例》已作修訂,並在為期兩年的過渡期結束後於二零一零年七月一日生效。數種新增的防腐劑現已獲准用於多類食物中。

我們將會在下一期詳談這些有效工具在各類食物中的應用情況。

To keep the local food legislation abreast of international development, the Preservatives in Food Regulation was amended and came into effect on 1 July 2010 following a transitional period of two years. Several additional preservatives are now permitted in various foods.

In the next issue, we shall explore further the applications of some of these powerful tools in a variety of food.

本港新增的准許防腐劑

Newly Permitted Preservatives in Hong Kong

新增的准許防腐劑 Newly Permitted Preservatives	應用例子 Examples of Applications
二甲基二碳酸鹽 Dimethyl dicarbonate	汽水及酒類 Soft drinks and wines
葡萄糖酸亞鐵 Ferrous gluconate	浸漬橄欖 Pickled olives
甲酸 Formic acid	醬料及汽水 Sauces and soft drinks
六亞甲基四胺 Hexamethylene tetramine	波蘿伏洛乳酪 Provolone cheese
檸檬酸異丙酯類 Isopropyl citrates	汽水及肉乾 Soft drinks and dried meats
溶菌酶 Lysozyme	乳酪及酒類 Cheeses and wine
游霉素 Pimaricin	乳酪及肉乾 Cheeses and dried meats
氯化亞錫 Stannous chloride	罐頭水果及蔬菜 Canned fruits and vegetables

食物事故點滴 Food Incident Highlight

有殼雞蛋中的沙門氏菌

自今年五月起,美國的腸炎沙門氏菌感染個案不斷增加。調查發現,受污染的有殼雞蛋可能來自 Wright County 及 Hillandale 雞蛋養殖場。

沙門氏菌存在於有殼雞蛋的表面和內部。多種沙門氏菌均可引起人類食物中毒,症狀包括噁心、發燒、腹痛和肚瀉,有時更會出現嘔吐。

食物安全中心(中心)已通知業界此事,本港蛋商回覆指,問題雞蛋沒有進口本港。此外,中心又向美國有關當局跟進此事。美國駐香港總領事館表示,據知問題有殼雞蛋並無供港。不過,中心建議消費者切勿進食生或未經徹底煮熟的雞蛋,以盡量減低感染腸炎沙門氏菌的風險。

Salmonella in Shell Eggs

Since May 2010, the number of *Salmonella* Enteritidis (SE) infections has increased in the United States. According to the investigation, two potential sources of contaminated shell eggs have been identified, namely Wright County Egg and Hillandale Farms.

Salmonella can be found both on the surface and inside of shell eggs. A number of *Salmonella* species can cause food poisoning in humans. The symptoms include nausea, fever, abdominal pain, diarrhoea and sometimes vomiting.

The Centre for Food Safety (CFS) has alerted the trade and responses from local egg traders indicated no affected eggs have been imported to Hong Kong. The CFS has also followed-up the incident with the U.S. authorities. According to the U.S. Consulate General, there was no known export of affected shell eggs to Hong Kong. Nonetheless, the CFS advises consumers not to consume raw or undercooked eggs in order to minimise the risk of SE.

內地小龍蝦與橫紋肌溶解症

中國疾病預防控制中心在今年八月七日指出,南京有23人在食用小龍蝦後患上瀉湖病(又稱哈夫病),出現橫紋肌溶解症。

橫紋肌溶解症症狀為肌肉溶解,並可引致腎臟受損和其他併發症。自一九二四年起,北歐、前蘇聯、美國、巴西阿馬遜地區和中國等地曾發生由食用淡水魚和小龍蝦引致的橫紋肌溶解症零星個案或羣組爆發。此症可能是積累在有關動物體內未知的耐熱毒素引致。初時受到懷疑,但現時沒有證據顯示,主要成分是草酸的“洗蝦粉”(有時會用作增強小龍蝦的色澤)會引致橫紋肌溶解症。

直至今日為止,本港未見同類病症報告。市民不應過量進食小龍蝦。如進食小龍蝦後感到不適,應立即求診。

Crayfish and Rhabdomyolysis in the Mainland

The Chinese Centre for Disease Control and Prevention reported on 7 August 2010 that 23 patients in Nanjing with rhabdomyolysis were suffering from Haff disease, after consumption of crayfish (crawfish).

Rhabdomyolysis is a condition with muscle breakdown, which may result in kidney damage and other complications. Since 1924, the condition has been linked to consumption of freshwater fish and crayfish in Northern Europe, the former Soviet Union, United States, Amazonian Brazil and China, as both sporadic cases or in clusters. An unknown heat-stable toxin that accumulated in the implicated food is a possible cause. For the initial suspect, the “crustacean-washing powder” with oxalic acid as the main ingredient and sometimes used for enhancing the colour of the crayfish is not associated with rhabdomyolysis according to the available evidence.

No similar case has been reported in Hong Kong to date. One shall not overindulge in crayfish and should seek medical attention immediately if feels unwell after consumption.



小龍蝦 crayfish