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焦點個案 Incident in Focus

非洲豬瘟並不威脅食物安全

African Swine Fever is Not a Threat to Food Safety

食物安全中心
屠房(獸醫)組林明思獸醫師及
獸醫公共衛生組陳正民獸醫師報告

二零一八年八月三日，內地公布首次爆發非洲豬瘟，疫症發生於遼寧省瀋陽市。隨後全國多個省份的豬場受到影響。根據內地向世界動物衛生組織報告的數字，有超過320 000頭豬被宰殺及處置以控制疫情。

何謂非洲豬瘟？

非洲豬瘟是嚴重的豬隻病毒性疾病，具高度傳染性，在1920年代於肯亞發現。根據世界動物衛生組織報告，非洲其他地區、歐洲部分地區、南美洲及加勒比海在歷史上也曾爆發過疫情。近年來(自二零零七年起)，非洲、亞洲及歐洲多國據報都出現疫情。非洲豬瘟只會感染豬隻，死亡率可高達100%。由於目前並無疫苗或治療方法，因此非洲豬瘟對養豬業構成嚴重威脅。

非洲豬瘟可在豬隻之間經直接或間接接觸傳播。豬隻受感染後需時約4至19天才發病，但病毒可在病徵出現前兩天已開始傳播。病毒會經所有分泌物，例如唾液、淚水、鼻涕等，以及尿液、糞便等排泄物排出，並可長時間存活於排泄物、屠體、鮮肉及某些肉類產品中。雖然這病毒可在受污染的肉內長時間生存，但以攝氏70度加熱30分鐘，即可殺滅。



非洲豬瘟不會感染人類

非洲豬瘟不是人畜共患的疾病(即不會感染人類的動物疾病)，故對人類健康並無威脅。非洲豬瘟病毒外面有表面蛋白質，必須與宿主細胞結合才能進入和複製。動物的物種不同，其細胞外面的蛋白質亦有所不同，某些病毒只能附着在若干物種動物的細胞表面。非洲豬瘟病毒便只能附着於並進入豬隻的特定細胞。

Reported by Dr. Maisie Lam, Veterinary Officer, Slaughterhouse (Veterinary) Section and Dr. Raymond Chan, Veterinary Officer, Veterinary Public Health Section, Centre for Food Safety

Mainland China reported its first outbreak of African Swine Fever (ASF) in Shenyang, Liaoning Province on 3 August 2018. Since then, multiple farms across the country have been affected and based on the figures Mainland China reported to the World Organisation for Animal Health (OIE), there are more than 320 000 pigs have been killed and disposed in order to control the disease.

What is African Swine Fever?

ASF is a serious, highly contagious, viral disease of pigs. This disease was described in Kenya in the 1920s and according to the OIE, outbreaks have also been reported in other parts of Africa and parts of Europe, South America and the Caribbean historically. More recently (since 2007) the disease has been reported in multiple countries across Africa, Asia and Europe. This disease only affects pigs and the death rate can reach up to 100%. There is currently no vaccine or treatment available. As a result, ASF is a severe threat to pig production systems.

The disease can be transmitted by direct or indirect contact between pigs. Once infected, it can take around 4 to 19 days before the pig starts to show sickness and the shedding of virus can begin up to two days prior to the presence of the clinical signs. Virus will shed through all secretions e.g. saliva, tears, nasal discharge, etc. and excretions e.g. urine, faeces, etc. and able to survive in excretions, carcasses, fresh meat and certain meat products for long periods of time. Although the virus can survive a long time in contaminated meat, the virus can be heat inactivated by 70°C for 30 minutes.

圖1：急性非洲豬瘟的病徵

Figure 1. Clinical signs of acute African Swine Fever

A：豬隻明顯虛弱並發燒，蜷縮一起取暖

B-E：出血性腹瀉，頸部、胸部及四肢範圍皮膚明顯充血(泛紅)

F：耳尖發紫(泛藍)

G-I：腹部、頸部及耳朵皮膚呈壞死斑

資料來源：Beltrán et al., 2017

A. Pigs are visibly weak with fever and huddle to stay warm.

B-E. Bloody diarrhoea and distinct hyperaemic (red) areas on skin of neck, chest and extremities.

F. Cyanosis (bluing) at the tips of ears.

G-I. Necrotic lesions on skin of the abdomen, neck and ears.

Source: Beltrán et al., 2017

African Swine Fever Does Not Infect Humans

ASF is not a threat to human health as it is a non-zoonotic disease, that is, a disease of animals that does not infect humans. Viruses have surface proteins on the outside which must bind to a host cell in order to enter and replicate. Different species of animals have different proteins on the outside of their cells and certain viruses can only bind to the surface of cells in particular species of animals. The ASF virus can only attach to

焦點個案
Incident in Focus

胞，而非人體細胞。自發現非洲豬瘟的過去一世紀以來，至今沒有證據顯示病毒曾出現變異而引致跨物種傳播並感染人類。

進口管制站的非洲豬瘟防疫措施

為了配合政府防範非洲豬瘟傳入本地豬場，食物安全中心已加強監察所有從內地供港的活豬。每批進口豬隻均須作文件檢查，以確定附有有效的衛生證明書，證明豬隻沒有出現非洲豬瘟病徵，同時並非來自受非洲豬瘟影響的豬場/地區。此外，也會即時進行檢驗，以確保所有豬隻健康良好，並無出現非洲豬瘟疑似病徵。

屠房的非洲豬瘟防疫措施

應對非洲豬瘟的最佳策略，就是提升生物安全來防止病毒入侵。自內地爆發非洲豬瘟以來，香港特區政府已在豬場及屠房實施嚴格的生物安全措施，以減低非洲豬瘟傳入本地豬場的可能性。為了減少非洲豬瘟病毒進出屠房的機會，下述措施亦已落實。

豬隻在運抵屠房後，加強宰前檢驗，包括在存豬欄中進行監察，並特別注意是否有非洲豬瘟的跡象及異常死亡的情況。在屠宰後，屠體亦必須通過由衛生督察進行的宰後檢驗，以確保適宜供人食用才出售。屠房已加強清潔及消毒的工作，而為了預防非洲豬瘟傳入本地豬場，運豬車的清潔消毒亦有所加強。

此外，如發現有豬隻懷疑感染非洲豬瘟，會抽取樣本送交漁農自然護理署的獸醫化驗所進行檢測。

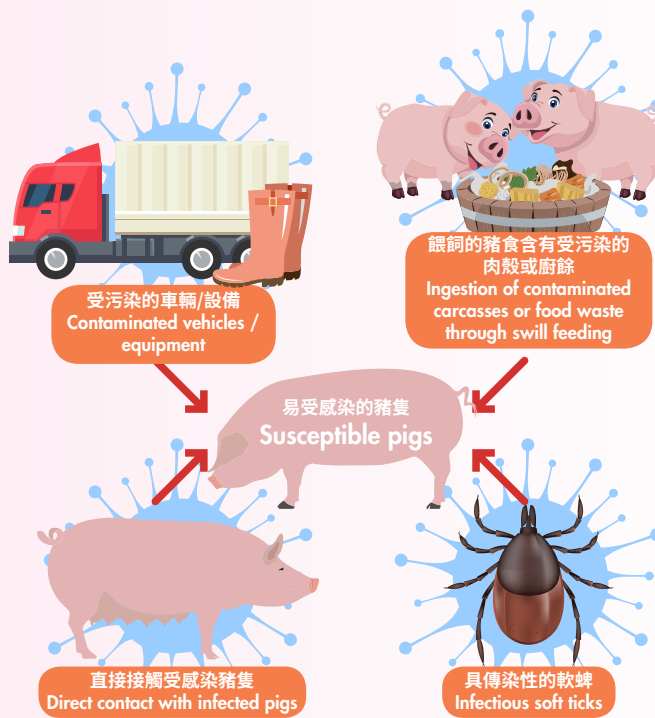


圖2：非洲豬瘟的傳播途徑
Figure 2. ASF routes of transmission.

and enter specific cells in pigs but not cells in the human body. Since the discovery of ASF, there has so far been no evidence of mutation causing cross-species transmission to humans in the past century.

Measures Taken Against ASF at the Import Control Point

As part of the government's efforts to prevent the disease from spreading to local pig farms, the Centre for Food Safety has stepped up its monitoring plan to all live pigs imported from Mainland China. For each consignment of the imported pigs, there will be a documentary check to ascertain that the consignment is accompanied with a valid health certificate which attests that the pigs do not show clinical signs of ASF, and that the animals are not originated from ASF affected farms/regions. In addition, physical inspection will be carried out at the site to ensure all pigs are physically healthy and do not show clinical signs suggestive of ASF.

Measures Taken Against ASF in Slaughterhouses

The best strategy against ASF is preventing the entry of the virus through improved biosecurity. Since the start of ASF outbreaks in Mainland China, Hong Kong SAR government has enforced strict biosecurity measures at farms and slaughterhouses to reduce the likelihood of ASF incursion into local farms. The following measures have been put in place to reduce the chance of ASF virus entering and leaving the slaughterhouses.

Upon arrival, pigs are subjected to more stringent ante-mortem examinations, including monitoring of animals in lairages (animal holding areas) with increased vigilance for signs of ASF and abnormal mortalities. After slaughter, carcasses must also pass post-mortem inspections by health inspectors to ensure they are fit for human consumption before going to retail. Cleansing and disinfection within the slaughterhouses have been strengthened and to prevent spread of disease to local farms, cleansing and disinfection of the livestock conveying trucks have been reinforced.

In addition, if pigs are suspected to have ASF, samples will be taken and sent to the Veterinary Laboratory of Agriculture, Fisheries and Conservation Department for testing.

注意事項

1. 非洲豬瘟只會影響豬隻。
2. 非洲豬瘟病毒只可感染豬隻的細胞，不能進入人類細胞，因此並不構成食物安全問題，對人類健康沒有威脅。
3. 為了配合政府防範非洲豬瘟傳入本地豬場的防疫工作，進口管制站的監控措施及屠房的生物安全保障均已加強。

Key Points to Note

1. ASF only affects pigs.
2. This virus can only infect cells in pigs and cannot enter human cells, therefore it is not a food safety concern and not a threat to human health.
3. As part of the government's effort to prevent ASF from spreading to local pig farms, control measures at import control point and biosecurity at slaughter houses have been strengthened.

給市民的建議

- 向可靠的持牌店鋪購買肉類。
- 豬肉必須徹底煮熟才可食用，因為未經煮熟的豬肉可能含有食源性病原體。
- 切勿攜帶肉類和野味入境，有官方衛生證明書者除外。

Advice to the Public

- Purchase meat from reliable and licensed premises.
- Pork should always be fully cooked before consumption as undercooked pork may harbour foodborne pathogens.
- Do not bring any meat or game into Hong Kong without official health certificates.

給業界的建議

- 進口商應從准許來源地入口肉類。

Advice to the Trade

- Importers should obtain meat from approved sources.

* Beltrán-Alcrudo, D., Arias, M., Gallardo, C., Kramer, S. & Penrith, M.L. 2017. African swine fever: detection and diagnosis – A manual for veterinarians. FAO Animal Production and Health Manual No. 19. Rome. Food and Agriculture Organization of the United Nations (FAO). 88 pages.

魚及魚製品中的組胺

Histamine in Fish and Fish Products

食物安全中心風險評估組
研究主任翁智仁先生報告

Reported by Mr. Kenneth Yung, Research Officer,
Risk Assessment Section, Centre for Food Safety

在我們享用的各式佳餚中，魚類往往佔一席位。然而，進食含有大量組胺的魚及魚製品，可引致鯖魚中毒(又稱組胺中毒)。香港衛生署衛生防護中心在二零零九年至二零一八年共錄得26宗本地鯖魚中毒個案，涉及45人。在本文中，我們會討論組胺如何產生，以及有何方法控制魚及魚製品的組胺含量。

Fish is an important part of many types of cuisine that we savour. However, the consumption of fish and fish products containing high level of histamine may cause scombrototoxin fish poisoning (SFP), also called histamine poisoning. In Hong Kong, the Centre for Health Protection of the Department of Health recorded a total of 26 local SFP cases, affecting 45 persons from 2009 to 2018. In this article, we discuss how histamine is formed and the ways to control level of histamine in fish and fish products.

魚及魚製品中的組胺如何產生

組胺是在魚及魚製品變壞和發酵的過程中，由製造組胺的細菌產生的有毒代謝物。許多製造組胺的細菌，都屬剛捕獲的魚類之皮、鰓及腸內天然微生物菌羣的一部分。製造組胺的細菌在繁殖時分泌出組胺酸脫羧酶，將天然存在於魚類中的組胺酸(一種氨基酸)轉化為組胺。

魚及魚製品的組胺含量，主要視乎魚類品種及時間與溫度控制而定。某些魚類，例如鯖魚、沙甸魚、吞拿魚及鯷魚，天然含有大量組胺酸，與香港及/或其他地方的鯖魚中毒個案相關。

要確保較易產生組胺的魚類品種可以安全食用，控制時間與溫度是最有效的方法。若缺乏適當的時間與溫度控制，例如未有存放於雪櫃或冷藏，組胺便有可能在供應鏈任何一環產生。食物環境衛生署與消費者委員會曾進行聯合研究，結果顯示開罐後的罐頭魚樣本在置於室溫下24小時後，檢出可導致鯖魚中毒的大量組胺(多達每公斤2600毫克)。然而，在攝氏2度下存放168小時的樣本，則沒有檢出組胺。

組胺對健康的影響

鯖魚中毒是因進食大量組胺的食物所引致，健康人士如吃下250克食用分量的魚或魚製品，而當中的組胺含量超過每公斤200毫克，便有可能出現中毒症狀，包括口部刺痛灼熱、面部潮紅出汗、噁心、嘔吐、頭痛、心悸、暈眩及出疹。情況較為嚴重者，據報會哮喘發作或出現較嚴重的心臟症狀。這些症狀會在進食後數小時內出現，通常在12小時內消失，並無長期影響。

控制魚及魚製品中的組胺

魚及魚製品可積累大量組胺，而未出現變壞的跡象(例如臭味或變味)。因此，在食物鏈中由捕魚至食用各個環節均應採取組胺控制措施。

在供應鏈中各個環節，例如在漁船卸載漁獲及加工過程期間，應確保冷鏈維持於攝氏4度或以下。冷凍魚及魚製品應貯存於攝氏零下18度或以下。運輸車輛或漁船應有足夠設備令魚類保持在低溫狀態，並在運載魚類前進行預冷(如適用者)。足夠的加熱處理(例如烹



圖3：含大量天然存在的組胺酸的魚類例子：(a)鯖魚、(b)沙甸魚、(c)吞拿魚及(d)鯷魚。這些魚類的部分製品亦被發現含有大量組胺。

Figure 3. Examples of fish which contain elevated levels of naturally occurring histidine: (a) mackerel, (b) sardine, (c) tuna and (d) anchovy. Some of their respective products have also been found to contain high levels of histamine.

Formation of Histamine in Fish and Fish Products

Histamine is a toxic metabolite produced by histamine-producing bacteria during spoilage and fermentation of fish and fish products. Many histamine-producing bacteria are part of the natural microflora of the skin, gills and gut of freshly caught fish. Histidine decarboxylase (HDC) enzymes, synthesised by histamine-producing bacteria when they multiply, convert the amino acid histidine that are naturally present in fish into histamine.

The level of histamine in fish and fish products mainly depends on species of fish and time-temperature control. Certain fishes like mackerel, sardine, tuna and anchovy naturally contain high amount of histidine and have been associated with SFP cases in Hong

Kong and/or other places.

Time and temperature control is the most effective method for ensuring food safety for fish species prone to histamine production. In the absence of proper time-temperature control such as refrigeration and freezing, formation of histamine may occur at any point throughout the supply chain. Previous study conducted jointly by the Food and Environmental Hygiene Department and the Consumer Council revealed that high levels of histamine (up to 2600 mg/kg) that can cause SFP were detected in opened canned fish samples that were left at room temperature for 24 hours. However, histamine was not detected in samples that were kept at 2°C for up to 168 hours.

Health Effects of Histamine

SFP is caused by the ingestion of food containing high levels of histamine. Consuming a serving size of 250g fish or fish product with histamine level exceeding 200 mg/kg may cause symptoms in healthy individuals. Symptoms of SFP include tingling and burning sensation around the mouth, facial flushing and sweating, nausea, vomiting, headache, palpitations, dizziness and rash. Exacerbation of asthma and more serious cardiac manifestations were reported in more severe cases. The onset of symptoms is within a few hours after consumption and these symptoms will normally disappear in 12 hours without long term effect.

Control of Histamine in Fish and Fish Products

High levels of histamine can build up in fish and fish products before any signs of spoilage (e.g. bad smell or taste) develop. Therefore, measures for control of histamine should be taken along the food chain from harvest to consumption.

Care should be taken that the cold chain is maintained at or below 4°C along the supply chain, including points of transfer such as offloading of fish from the vessel and processing procedures. Frozen fish and fish products should be kept at or below -18°C. Transport vehicles or vessels should be adequately equipped to keep fish cold and pre-chilled before loading fish where applicable. Adequate heat treatment (e.g. cooking, hot smoking) can kill histamine-

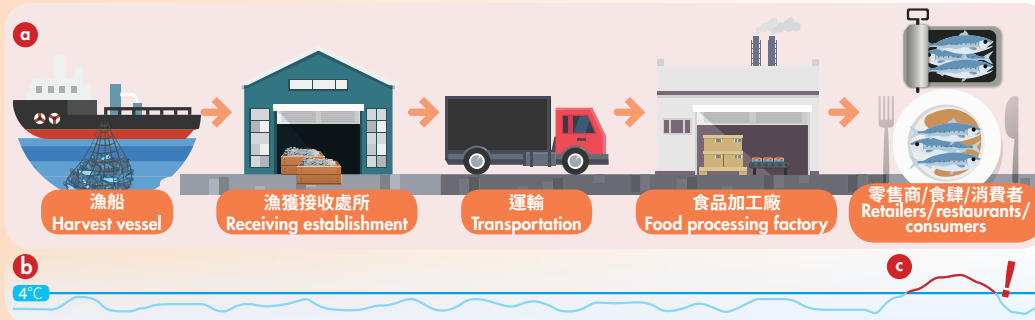


圖4：(a)在整個供應鏈中應維持冷鏈的完整。(b)冷藏魚及魚製品應貯存於攝氏4度或以下。(c)魚類製品置於室溫的時間應盡可能縮短。

Figure 4. (a) Cold chain should be maintained throughout the whole supply chain. (b) Refrigerated fish and fish products should be kept at or below 4°C. (c) The time which fish products are kept under ambient temperature should be minimised.

煮、熱熏)可殺死製造組胺的細菌，並使組胺酸脫羧酶失去活性，但不能破壞已形成的組胺。為保障食物安全，應遵從食品法典委員會《魚和魚製品操作規範》(CAC/RCP 52-2003)的建議。

消費者方面，購買魚類後應盡快將之冰鮮。如為預先包裝的魚及魚製品，應按照生產商的指示貯存(例如存放於雪櫃)。煮熟的魚及即食魚製品(例如吞拿魚三文治及已開罐的罐頭魚)，如長時間置於室溫，可能會再受污染並產生組胺。因此，這些食物如非即時食用，應存放在雪櫃內，並盡快吃完。

producing bacteria and inactivate HDC enzymes, but cannot destroy pre-formed histamine. Recommendations in the Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003), issued by Codex Alimentarius Commission, should be observed to ensure food safety.

At the consumer level, fish should be chilled rapidly after purchase. For prepackaged fish and fish products, store according to the instructions of the manufacturer (e.g. keep refrigerated). If cooked fish and ready-to-eat fish products (e.g. tuna fish sandwiches and opened canned fish) are placed at room temperature all day long, they can be recontaminated and histamine can form. Therefore, if these foods are not being eaten immediately, they should be kept under refrigeration and be finished as soon as possible.

食物事故點滴
Food Incident Highlight

避免進食鯪魚膽

上月，內地一名30歲男子在生吃三個魚膽後嘔吐和腹瀉，其後更出現肝腎衰竭症狀。魚膽及魚膽汁(包括鯪魚膽及其膽汁)可能含有多種有毒物質、微生物及寄生蟲。魚膽內有一些耐熱毒素，例如鯪醇硫酸鈉，不能經烹煮分解。吃下魚膽可導致由毒素引起的多器官功能障礙綜合症，或會致命。目前而言，尚未有可治療魚膽中毒的解毒劑。

為免造成由有毒物質引致食物中毒，不宜進食魚膽，無論生吃或經烹煮過程處理，都不建議。

Avoid Consuming Gall Bladder of Grass Carp

Last month, a 30-year-old man in Mainland China developed vomiting and diarrhoea, followed by liver and kidney failure after consuming 3 raw fish gall bladders. Fish gall bladder and its bile, including those found in grass carp variety, may contain a composite of toxic substances, microorganisms and parasites. Some toxins found in fish gall bladder such as sodium cyprinol sulfate are heat stable and cannot be decomposed by cooking. Ingestion of fish gall bladder may lead to multiple organ dysfunction syndrome caused by the toxin and may be fatal. Currently, there is no antidote for the treatment of fish gall bladder poisoning.

To avoid food poisoning caused by toxic substances, it is advised not to consume fish gall bladders, no matter they are in raw state or treated by cooking processes.

切勿進口或攜帶含有大麻的食品入境

Do Not Import or Bring Any Food Products Containing Cannabis into Hong Kong

加拿大《大麻法》在不久前正式生效，將消遣用大麻合法化並加以規管。在加拿大有可能購得含有大麻的食品及飲料。然而，香港《危險藥物條例》(第134章)訂明，非法進口大麻或含有受管制大麻素(例如四氫大麻酚)的產品，即屬刑事罪行。大麻二酚是大麻植物含有的另一種大麻素，但不屬危險藥物，不受《危險藥物條例》管制。不過，由於提煉純大麻二酚的過程困難，含有大麻二酚的食品及飲料很可能同時含有其他受管制的大麻素。

本地食物業界應避免進口或生產有關產品，以免觸犯法例。市民從外地攜帶或網上訂購食品入境時，應特別留意食品的成分及/或標籤。

The Cannabis Act in Canada which came into force recently legalises and regulates the recreational cannabis use. Cannabis containing foods and beverages may be available in Canada. In Hong Kong, under the Dangerous Drugs Ordinance (Cap.134), illicit import of cannabis or any products that contain controlled cannabinoids (such as tetrahydro-cannabinol, or "THC") constitutes a criminal offence. Cannabidiol (CBD) is another cannabinoid present in cannabis plants but is not a dangerous drug controlled under Cap. 134. However, since it is difficult to extract pure CBD, food products and drinks that contain CBD may highly likely contain other controlled cannabinoids.

The local food trade should avoid importing or manufacturing products concerned lest they would breach the law. Members of the public should pay special attention to the ingredients and/or labels of the food products when bringing food from overseas places into Hong Kong or ordering food on-line.



風險傳達工作一覽 (二零一八年十二月)

Summary of Risk Communication Work (December 2018)

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