

燒味長時間室溫存放下的微生物質素

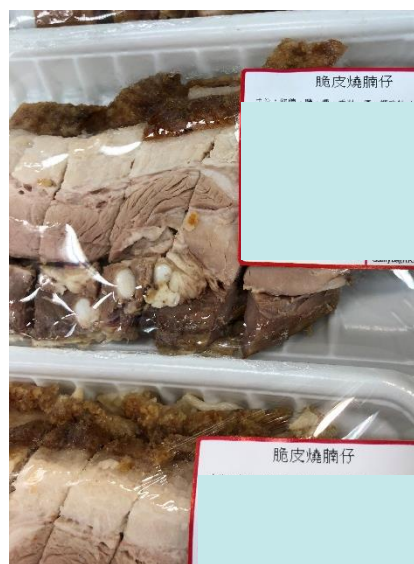
Microbiological Quality of Roast Meats when They are Kept at Ambient Temperature for a Prolonged Period of Time

21-07-2021



燒味

Roast Meats (Siu-mei)



- ▶ 高溫烤煮
- ▶ 通常在室溫陳列出售
- ▶ Roasted at high temperatures
- ▶ Usually display at room temperature for sale



對即食食物的建議

Recommendation for Ready-to-eat Food

室溫貯存時間 (小時)

Duration of storage at ambient temperatures (hours)

0 to 2

2 to 4

>4

可放入雪櫃留待稍後食用
Can be kept refrigerated for
final use later

時限屆滿前食用
Use within the time limit

丟棄
Discard

- ▶ 有潛在危害的即食食物可處於危險溫度範圍的總時限為**4小時**。
 - ▶ 總時限是指食物烹煮(或處理)後處於**攝氏4度至60度**環境的累計時限。
- ▶ The total time that a ready-to-eat potentially hazardous food can be kept out of temperature control is **4 hours**.
 - ▶ The total time is the sum of the time the food is at temperatures between **4°C and 60°C** after it has been cooked (or processed) to make it safe.



燒味 Roast Meats (Siu-mei)



- ▶ 可以在室溫長時間陳列？
(消費者亦可能會在室溫貯存)
- ▶ Can display for a prolonged period of time at room temperature?
(Consumers may also leave roast meats at room temperature)



目的 Objectives




- ▶ 評估燒味在室溫下展示時的微生物質量變化
 - ▶ 包括可供微生物生長的自由水分子（水活性）
- ▶ To assess the changes in the microbiological quality of roast meats during displaying at ambient temperature
 - ▶ Including water availability for microorganisms to grow (water activity, a_w)



概述




Overview

▶ 把燒味存放於願意協助研究商戶的店舖

- ▶ 3x 獨立店/餐廳 
- ▶ 3x 連鎖店/餐廳 
- ▶ 2x 超級市場 

▶ 在0、4、6和8小時後收集燒味樣本進行測試

▶ Store roast meats at the shops of cooperating traders

- ▶ 3x individual stores/restaurants 
- ▶ 3x chain stores/restaurants 
- ▶ 2x supermarkets 

▶ Collect samples for testing at time 0, 4 hrs, 6 hrs, and 8 hrs



方法 Methodology

預留燒味樣本存放於店舖
Store reserved portions at the shop

0、4、6和8小時後收
集部分樣本進行測試
Collect portion at time
0, 4, 6 & 8 hours

 非斬件樣本
Unchopped samples

 斬件樣本
Chopped samples

叉燒
BBQ pork



燒肉
Roast pork



燒鵝/鴨
Roast goose
/duck



微生物測試
Microbio. tests



量度水活性
 a_w measurement

採集樣本時才斬件
Chopped when collecting samples

開始展示時斬件包裝
Chopped and wrapped at the beginning of display



微生物測試

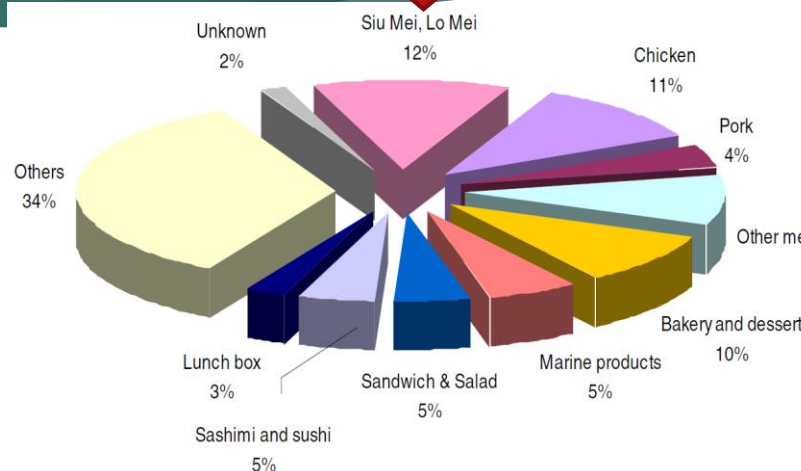
Microbiological tests

- ▶ 衛生質素：需氧菌落計數
- ▶ 衛生質素：大腸桿菌含量
- ▶ 安全：金黃葡萄球菌及其他凝固酶陽性葡萄球菌（葡萄球菌含量）

(根據食品微生物含量指引)

- ▶ **Hygienic Quality:** Aerobic colony count (ACC)
- ▶ **Hygienic Quality:** *E. coli* count
- ▶ **Safety:** *S. aureus* and other coagulase-positive staphylococci (SA count)

(According to Microbiological Guidelines for Food)



2001-2009年與確診和懷疑的葡萄球菌食物中毒個案有關的食物傳播媒介
Food vehicles associated with confirmed and suspected staphylococcal food poisoning outbreaks, 2001-2009

(CHP, 2011)



水活性 Water Activity

- ▶ 燒肉和燒鴨 / 鵝：分開量度皮和肉
- ▶ 叉燒：量度整分
- ▶ Roast pork and roast duck/goose: skin & meat separately
- ▶ BBQ pork: Whole

一些食物的水活性

Water activity of some foods

鮮肉和魚 Fresh meat and fish	0.99
麵包 Bread	0.95
醬油 Soy sauce	0.80
乾果 Dried fruit	0.6
奶粉 Milk powder	0.2

大多數細菌和真菌都可以在水活性 >0.9 生長
Most bacteria and fungi can grow at $a_w >0.9$



結果 – 需氧菌落計數

Results – ACC

樣本 Samples	增長 Increase	下降或維持不變 Decrease or remain unchanged
非斬件樣本 Unchopped (n=18)	8 (1.5x – 60x)	10
斬件樣本 Chopped (n=6)	6 (3x – 293x)	0

5/6
增長至不滿意水平
Grow to unsat. levels

▶ 其中5個包裝樣本在室溫下存放超過6小時或8小時後，需氧菌落計數增加至超過相關限值

▶ ACC: **5/6 chopped samples exceeded the limit** after storage under ambient conditions for more than 6 hours or after 8 hours



結果 – 大腸桿菌

Results – *E. coli*

- ▶ 大腸桿菌：只有兩個樣本在剛開始展示時分別檢出每克樣本20和40菌落形成單位
 - ▶ 展示後的樣本都沒有發現大腸桿菌（每克樣本 < 20菌落形成單位）
-
- ▶ *E. coli*: only two samples were reported to have 20 and 40 cfu/g respectively at the start of display
 - ▶ No *E. coli* (<20 cfu/g) was detected after display

衛生質素: 極少直接或間接受到糞便污染

Hygienic quality: Minimal direct or indirect faecal contamination



結果 – 葡萄球菌含量

Results – SA count

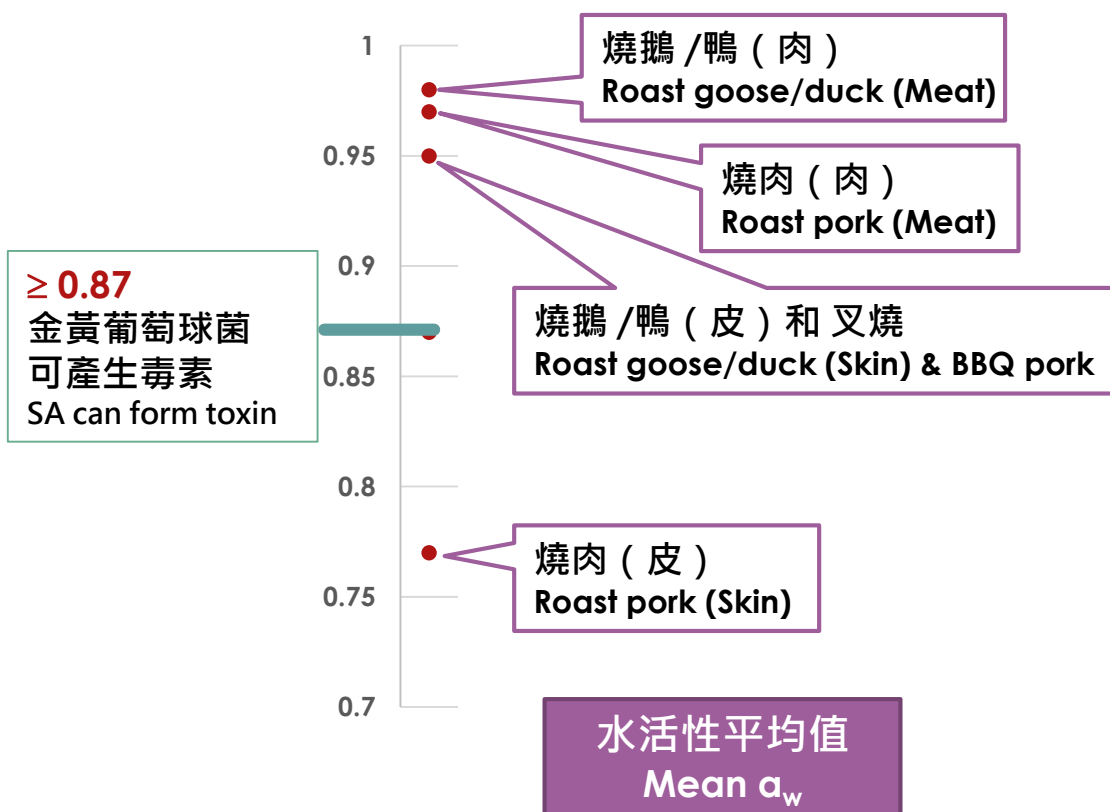
- ▶ 三間店鋪全部三種燒味樣本都驗出金黃葡萄球菌，全都是非斬件樣本
- ▶ 展示八小時後，亦沒有增長至可能危害健康的水平（增長0.3x – 37x）
- ▶ All three types of roast meat samples in three shops were also found with *S. aureus*
- ▶ None of the SA counts were found to increase to a level that potentially injurious to health, even after display for eight hours (increased 0.3x – 37x)

展示前 Before display	獨立店，非斬件 Individual, unchopped			連鎖店，非斬件 Chain, unchopped			超級市場，斬件 Supermarket, chopped		
	店鋪 Shops	A	B	C	A	B	C	A	B
叉燒 BBQ pork	+	+			+				
燒肉 Roast pork	+	+			+		+		
燒鵝/鴨 Roast goose/duck	+	+			+				

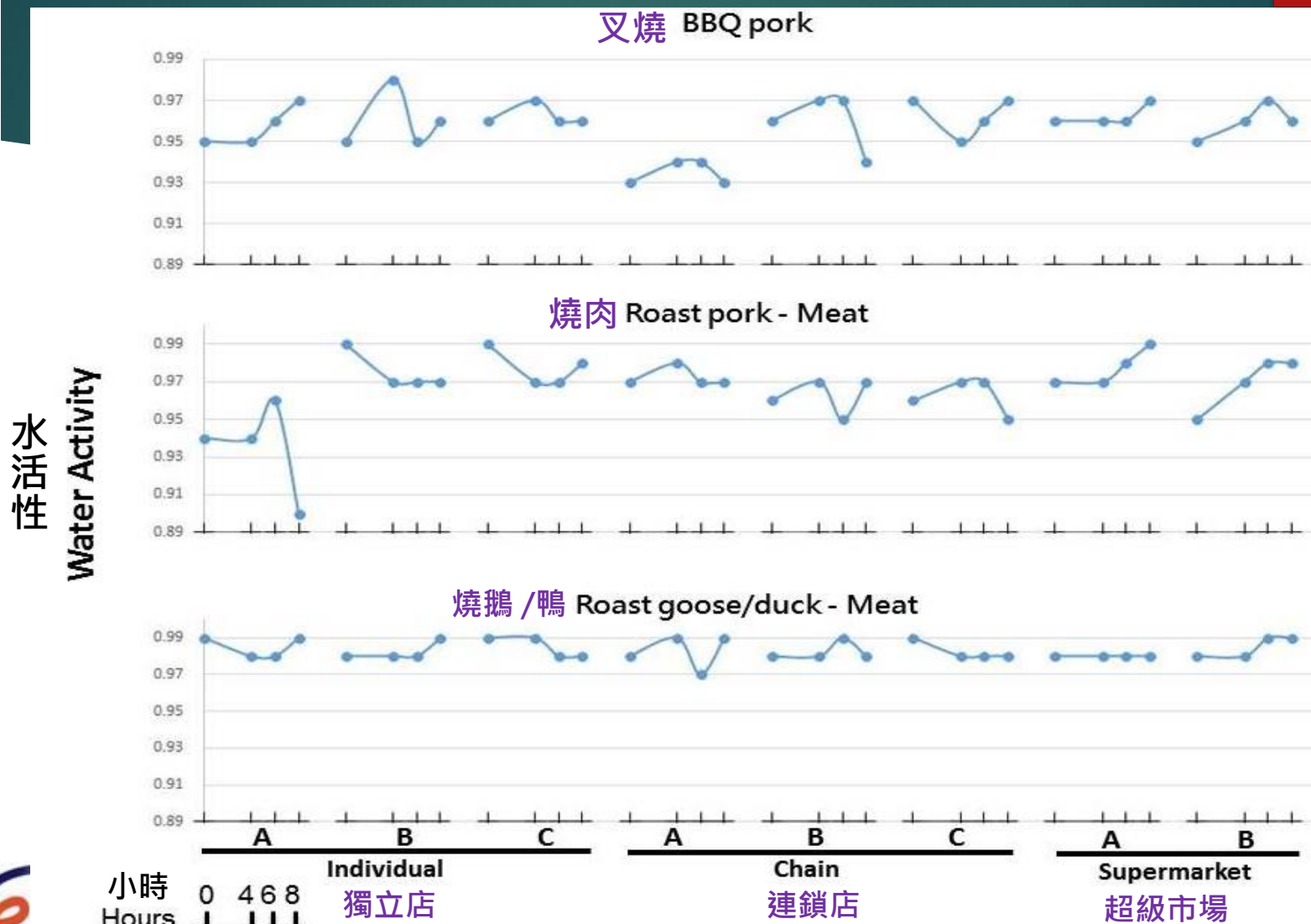
結果 – 水活性

Results – Water Activity

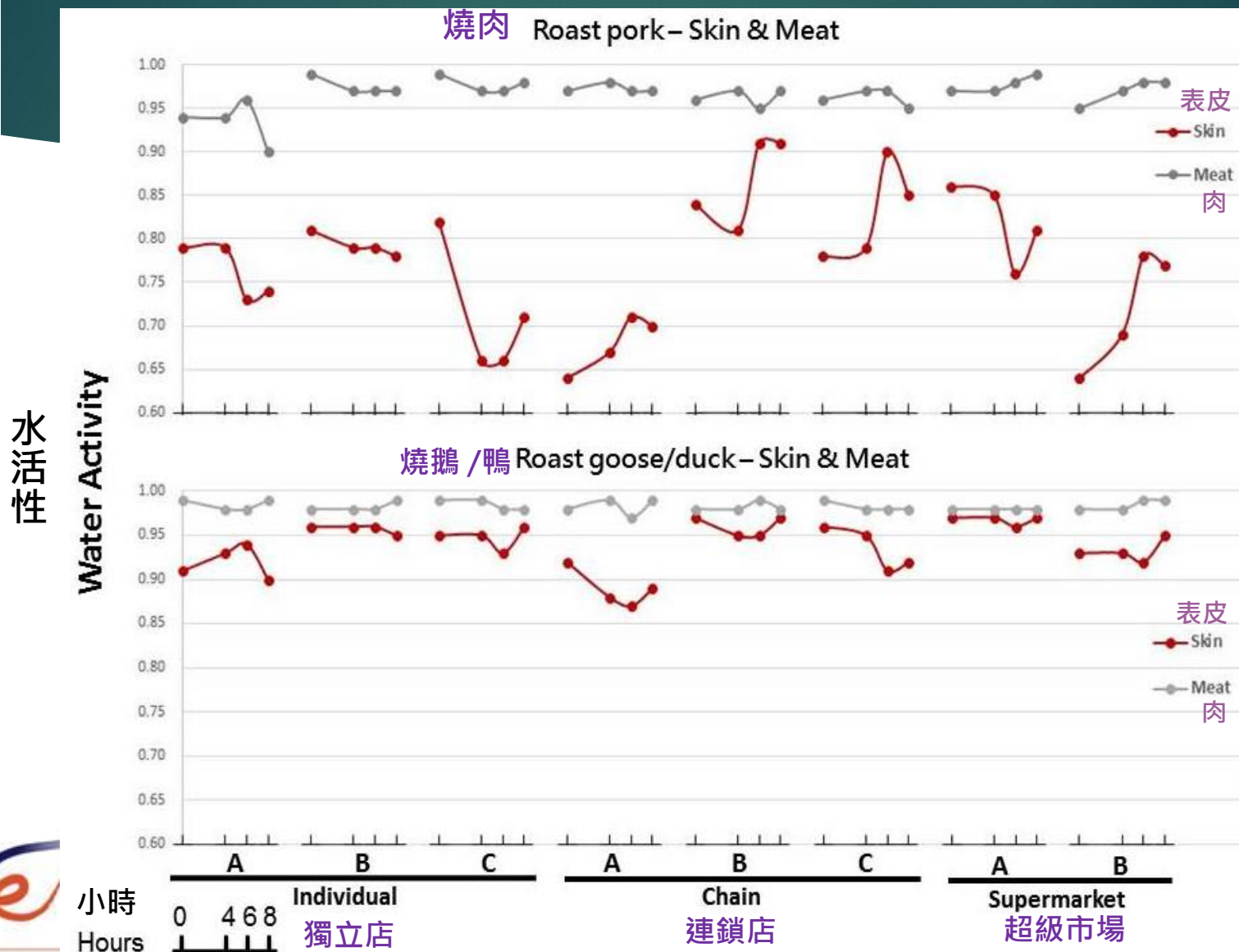
展示前
Before display



結果 – 水活性 Results – Water Activity



結果 – 水活性 Results – Water Activity



小時
Hours

0 4 6 8

Individual
獨立店

Chain
連鎖店

Supermarket
超級市場



結果 – 水活性

Results – Water Activity

展示期間變化 Changes during display

- ▶ 燒肉表皮樣本能夠保持較低水活性
 - ▶ 用保鮮紙包裝的斬件樣本的水活性總體上略有增加
-
- ▶ Roast pork skin samples were able maintain at lower a_w
 - ▶ The a_w of the chopped samples wrapped in cling film in general increased slightly



討論 – 微生物質素的變化

Discussion – Change of Microbiological Quality



討論 – 微生物質素的變化 (1)

Discussion – Change of Microbiological Quality

- ▶ 研究結果顯示燒味斬件前並不利於細菌快速生長
 - ▶ 現時業界將沒有斬件的燒味整塊展示一段時間的做法，不太可能對公眾健康構成風險



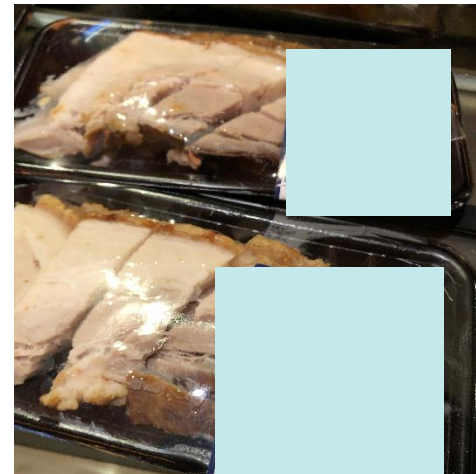
- ▶ The results revealed that roast meats, before being chopped into pieces, do not favour rapid bacterial growth
 - ▶ Current trade practice of displaying the whole pieces of roast meats for a period of time without temperature control is unlikely to pose a public health risk



討論 – 微生物質素的變化 (2)

Discussion – Change of Microbiological Quality

- ▶ 燒味經斬件後細菌可以在表面快速生長
 - ▶ 用保鮮紙包裝的樣本的水活性總體上略有增加，水活性增加可能有助細菌生長
-
- ▶ Bacteria can growth rapidly on the surfaces of the meats when freshly prepared roast meats are chopped into pieces
 - ▶ The a_w of the samples wrapped in cling film in general increased slightly and this increased a_w might have a positive effect on the growth of bacteria.



討論 – 微生物質素的變化 (3)

Discussion – Change of Microbiological Quality

- ▶ 即使在室溫環境下存放八小時後，金黃葡萄球菌含量也遠低於可能危害健康的水平
- ▶ 食品處理人員應繼續遵守良好衛生守則，以防止燒味受污染
- ▶ 如果斬件燒味被金黃葡萄球菌污染，可能會迅速繁殖至對公眾健康構成影響的水平

- ▶ *S. aureus* did not grow to the level that is potentially injurious to health fast, even after storage for eight hours under ambient conditions
- ▶ **Food handlers should continue to observe the good hygienic practices to prevent roast meats from being contaminated**
- ▶ If chopped roast meats are contaminated with *S. aureus* by food handlers after roasting, *S. aureus* is likely to multiply quickly to a level that has public health concern.

金黃葡萄球菌可能存在於：
S. aureus may present on



建議

Recommendations



給公眾的建議

Advice to Public

- ▶ 如果購買即場切件的燒味，要在購買後四小時內食用。
- ▶ 如果購買展示在食品展示櫃檯上的已包裝的斬件燒味，要盡快食用或放入雪櫃貯存。

- ▶ If you purchase roast meat which are chopped at the moment of purchase, consume them within four hours after purchase.
- ▶ If you purchase packaged chopped roast meats which have already been displayed on a food display counter, consume them as soon as possible or keep them under refrigeration.



給業界的建議

Advice to Trade

- ▶ 業界選擇在室溫下以包裝展示形式出售已斬件燒味：
 - ▶ 最好於斬件後兩小時內售出燒味，製作後的售賣時間最長不應超過四小時；
 - ▶ 可以加上忠告，提醒消費者應盡早食用斬件燒味或放入雪櫃貯存。
- ▶ Food businesses choosing to sell chopped roast meats in package forms at room temperature:
 - ▶ should sell the products preferably within two hours after chopping and limit the time of sale to less than four hours after preparation;
 - ▶ can include an advisory to remind consumers to consume the chopped roast meats or keep them refrigerated as soon as possible.



研究局限 Limitations

- ▶ 由於資源所限，只能從八家商戶中取樣，而且未能進行有效期測試（challenge test）以斷定安全期限
- ▶ 細菌生長變化較大
 - ▶ 細菌在環境中的分佈可能不均勻，使燒味受細菌污染情況難以預測
- ▶ Samples from only eight shops were taken, and challenge tests were not conducted to determine the end points of safety due to resource limitation
- ▶ Growth of bacteria were quite variable
- ▶ Bacteria were likely unevenly distributed in the environment, rendering the contamination of roast meats with bacteria unpredictable



結論

Conclusion

- ▶ 沒有溫度控制下展示整塊燒味一段時間，不太可能對公眾健康構成風險
 - ▶ 燒味的表面不利於細菌快速生長
 - ▶ 細菌在斬件並以包裝形式展示的燒味上可能會加快生長
 - ▶ 切開表面將不能保護燒味以免細菌快速生長
 - ▶ 製作後燒味的展示時間最長不應超過四小時，斬件燒味最好於斬件後兩小時內售出
- ▶ Displaying whole pieces of roast meats for a period of time without temperature control is unlikely to pose a public health risk
 - ▶ The surfaces of the uncut roast meats do not support rapid bacteria growth
 - ▶ Bacteria may grow rapidly on roast meats that have been chopped and packed
 - ▶ The surfaces no longer protect the roast meat from rapid bacterial growth
 - ▶ Display time of roast meats should be less than four hours after preparation, and chopped roast meats are preferably to be sold within two hours after chopping



燒味員工個人和環境衛生要點

Advice on Personal and Environmental Hygiene for Siu-mei Handlers



戴上口罩

Wear a face mask



穿着清潔工作服

Wear clean uniform



經常清潔雙手

Wash hands frequently



即棄手套如損壞、弄污，
或員工小休後應棄掉

Discard disposable gloves when
damaged or soiled,
or after staff breaks



脫去或更換
手套時要洗手

Wash hands after removing or
changing gloves



定期以沸水或專用的
消毒劑消毒廚具、
工作台和抹布

Regularly sanitise utensils,
workstations and wiping cloths
with boiling water or sanitisers
for the purpose of use



處理燒味衛生守則

Good Hygiene Practices when Handling Siu-mei

1

確保充裕空間陳列
和存放以免燒味堆疊

Ensure sufficient space for display or storage to avoid
stacking of meats

2

用掛鈎或叉鉗拿取燒味
減少用手直接接觸

Carry the meats with a hanging hook or prong-pliers to
minimise direct contact of meat by hands

3

顧客購買時才切開燒味

Cut siu-mei only upon purchase

4

切開的燒味在室溫存放
多於4小時便須棄掉

Discard chopped siu-mei being kept under ambient
temperature for 4 hours

5

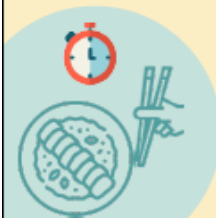
提醒顧客儘早食用燒味

Remind customers to consume *siu-mei* as soon as possible



買燒味? 食安仔安心提示

Buying siu-mei? Here are some tips from On



**切件的燒味, 特別是經包裝,
應盡早食用**

Chopped siu-mei, especially those in wrapped package, should be eaten as soon as possible.



**如稍後進食, 應盡快放入雪櫃,
並徹底翻熱才食用**

For consumption at a later time, keep the package under refrigeration as soon as possible and reheat siu-mei thoroughly before consumption.





謝謝
Thank you