

## What is Pasteurisation?

Pasteurisation, named after the inventor Louis Pasteur, is in general a process of heating foods to a specific temperature for a set period of time to destroy harmful microorganisms. Pasteurisation also extends the keeping quality of food by reducing the number of spoilage microorganisms in the product.

## Why Pasteurisation is Important?

Since a wide variety of germs (e.g. *Listeria*, *Mycobacterium bovis* (a cause of tuberculosis), *Salmonella*, *E. coli* 0157, parasites and viruses) are sometimes found in raw products such as raw milk and raw eggs, consumption of these raw foods can make people sick. Symptoms may vary depending on the type of germ, the amount of contamination and the person's immune defence. Common symptoms include vomiting, diarrhoea, abdominal pain and fever. More severe or even life-threatening symptoms such as renal failure and paralysis may be developed, especially in susceptible populations such as pregnant women, infants, young children, the elderly and people with weakened immune systems. Pregnant women in particular run a serious risk of becoming ill from the bacteria *Listeria monocytogenes* which can cause miscarriage, foetal death or illness/death of a newborn.

## Pasteurisation and Sterilisation

Pasteurisation and sterilisation are the two commonly used heat treatments for preserving foods such as milk to ensure food safety.

Pasteurisation is a relatively mild heat treatment (usually performed below 100°C) aiming to reduce harmful microorganisms in food. The nutritional quality and taste are not significantly affected by pasteurisation. Since pasteurisation does not kill all microorganisms, it is important to follow the storage instructions provided on food labels e.g. refrigerate pasteurised foods such as pasteurised milk and pasteurised juices at or below 4°C to prevent food from spoilage.

Sterilisation is a more severe heat treatment to destroy all microorganisms capable of growing in the food at normal conditions of storage. Unlike pasteurised products, sterilised products for example unopened ultra high temperature (UHT) treated milk can be stored at room temperature. Since the conditions for sterilisation are more severe than pasteurisation, sterilisation may cause changes in nutrition and taste.

## More about Pasteurisation on Specific Foods

Pasteurisation can be used to process various foods, including milk, eggs, juices and honey etc.

### Milk and Dairy Products



Raw milk may be contaminated by a number of sources such as infected animals and the dairy farm environment etc. Before the invention of pasteurisation, many people were sick and died of diseases like tuberculosis, typhoid fever, and other infections that were transmitted through consumption of raw milk.

For food safety reasons, milk sold for human consumption in Hong Kong must be heat-treated either by pasteurisation or sterilisation. Pasteurisation does not significantly reduce milk's nutritional value. Nutritional benefits of drinking milk are available from pasteurised milk without the risk of disease that comes with dairy products without pasteurisation.

Unlike raw milk, dairy products such as cheeses and yoghurt made from raw or unpasteurised milk are legal to sell in the local market. Aged cheeses such as Cheddar are generally safe even if they are made from raw milk because bacteria usually die off during the aging process. However, consuming other dairy products such as soft cheeses and yoghurt made from raw milk carries inherent food safety risk especially for susceptible populations.



### Eggs



Eggs are not laid in a sterile environment and can be contaminated with harmful bacteria such as *Salmonella*. Pasteurisation on the one hand can destroy dangerous bacteria and on the other hand does not cook the eggs or affect their colour, flavour, nutritional value or use. Egg white powder or dried egg white (pure albumen) is a pasteurised product which can reconstitute whips like fresh egg by mixing the powder with water. Since it is pasteurised, it can be used safely without cooking or for cake baking and decorating.

### Juices



Fruits and vegetables are grown in natural environments. They may be contaminated with harmful bacteria from soil and water as well as during preparation and storage. While it is important to wash fruits and vegetables during the squeezing process, any bacteria that are present on the inside or the outside of the fresh produce may contaminate the finished product. Pasteurisation kills any harmful microorganisms in juices while in general maintains the nutritional properties and other qualities of the product.



### Honey



In general, honey can be consumed pasteurised or not. Since honey usually has a relatively low water content and high acidity, harmful bacteria in general cannot survive in it. Unlike milk, eggs and juices, honey is not pasteurised for food safety reasons but for quality purposes.

Temperature used for pasteurising honey is not high enough to kill the spores that cause infant botulism, a rare disease caused by a food poisoning bacterium called *Clostridium botulinum* that can affect infants (a person not more than 12 months of age). The risk of infant botulism is present in both pasteurised and non-pasteurised honey. Hence, parents and caregivers should not give honey to infants.

## Measures to Reduce Your Risk

Susceptible populations and those who wish to reduce their risk of foodborne illnesses are advised to pay special attention to raw or unpasteurised products-

- Avoid eating high risk food items such as products made from raw milk, raw eggs and unpasteurised juices.
- Look for the word "pasteurised" on labels before buying cheeses, especially for soft, fresh, un-aged cheeses like Brie, Camembert and Queso Fresco, or ask the grocer or store keeper whether these cheeses are made from pasteurised milk. Do not eat if in doubt.
- If you choose to prepare homemade food that call for eggs that are raw or undercooked for example Caesar salad dressing and Tiramisu, use pasteurised eggs or pasteurised egg products instead of raw eggs.

# 巴士德 消毒面面觀



## 巴士德消毒是甚麼？

巴士德消毒以其發明者路易巴士德的名字命名，是一種把食物加熱至某個溫度並保持一段時間以消滅有害微生物的熱處理方法。巴士德消毒亦把產品中引致食物腐壞的微生物數量減少，從而延長食物的保質期。

## 巴士德消毒為何重要？

由於生的食物（例如生乳和生蛋）可能含有多種細菌（例如李斯特菌、牛型分枝桿菌（可引致結核病）、沙門氏菌、O157型大腸桿菌、寄生蟲和病毒），進食這些生的食物可能令人患病。因應細菌的種類、受污染的程度和個人免疫力，病人可能出現不同的病徵。常見的徵狀包括嘔吐、腹瀉、腹痛和發燒，嚴重者更會出現腎衰竭和癱瘓等足以致命的徵狀，高危人士如孕婦、嬰幼兒、長者和免疫力較低人士等尤其如是。值得一提的是，孕婦如因感染李斯特菌而患病特別危險，可能引致流產、胎兒死亡或新生嬰兒染病/夭折。

## 巴士德消毒和消毒

巴士德消毒和消毒是兩種常用的熱處理方法，作用是保存奶類等食物，確保食物安全。

巴士德消毒是一種較溫和的熱處理方法（通常在攝氏 100 度以下進行），目的是減少食物中的有害微生物，對食物的營養價值和味道沒有顯著的影響。由於巴士德消毒不會殺死所有微生物，因此應按食物標籤上的貯存指示，如冷藏經巴士德消毒的奶類和蔬果汁等食物於攝氏 4 度或以下，以免變質。

消毒是一種較劇烈的熱處理方法，以高溫殺死食物中所有能在一般貯存條件下繁殖的微生物。與巴士德消毒不同的是，經消毒的產品（例如經超高溫法處理而未開封的奶類），可在室溫下貯存。由於消毒法的處理條件較巴士德消毒的劇烈，食物的營養和味道可能會受到影響。

## 經巴士德消毒的食物

巴士德消毒可用於處理不同的食物，包括奶類、蛋類、蔬果汁和蜜糖等。

### 奶類和乳製品

生乳可能從不同途徑（例如受感染的動物及奶場的環境等）受到污染。在發明巴士德消毒法前，很多人因飲用生乳而染上結核病、傷寒及其他疾病，甚至死亡。

為確保食物安全，在香港售賣供人飲用的奶類必須經巴士德消毒或消毒的熱處理。巴士德消毒不會對奶類的營養價值有顯著的影響。飲用經巴士德消毒的奶類，既可得到喝奶的好處，又免除了因飲用生乳而染病的風險。

與生乳不同，用生乳或未經巴士德消毒的奶類而製成的芝士和乳酪等乳製品可合法在本地市場售賣。已成熟的芝士（例如車打芝士）即使用生乳製造，一般是安全的，因為細菌在成熟過程中通常會被消滅。但是，食用其他生乳製品（例如用生乳製成的軟芝士和乳酪）存在固有的食物中毒風險，對高風險人士而言尤其危險。



### 蛋類

家禽並非在無菌的環境中生蛋，所以禽蛋可能受有害細菌如沙門氏菌污染。巴士德消毒一方面能消滅危險細菌，另一方面不會把蛋弄熟或影響其色澤、味道、營養價值或用途。蛋白粉或乾蛋白都是經巴士德消毒的產品，只要加水沖調攪拌便與新鮮蛋糊無異。由於已經巴士德消毒，可以無須烹煮安全食用，或用以烘製和裝飾蛋糕。



### 蔬果汁

蔬果在天然環境中生長，可能受土壤和水中的有害細菌污染，亦有可能在配製和貯存過程受細菌污染。榨汁前把蔬果



清洗乾淨固然重要，但新鮮蔬果內外的細菌仍有可能污染蔬果汁。巴士德消毒能殺死蔬果汁中的有害微生物，而大致保留蔬果汁的營養成分和原有風味。

### 蜜糖

一般來說，經巴士德消毒與否的蜜糖也可安全食用，原因是蜜糖通常含水量較低而酸度高，有害細菌一般很難存活。因此，跟奶類、蛋類和蔬果汁不同，以巴士德消毒處理蜜糖不是為了食物安全的緣故，而是為了保質。

值得注意的是，以巴士德消毒蜜糖的溫度不足以殺死引致嬰兒肉毒中毒的孢子。嬰兒肉毒中毒是一種由肉毒桿菌引致的罕有疾病，染病的都是 12 個月以下的嬰兒。嬰兒進食蜜糖，無論有否經巴士德消毒，都有染上該病的風險。因此，父母和照顧人切勿給嬰兒餵食蜜糖。

## 減低風險的方法

高風險人士和希望減低食物中毒風險的人士應特別留意生或未經巴士德消毒的產品 -

- 避免進食高風險食物，例如生乳製品、生蛋和未經巴士德消毒的蔬果汁等。
- 在購買芝士前查看標籤上有否“經巴士德消毒”的字眼，特別是新鮮、未成熟的軟芝士，例如布里芝士 (Brie)、卡門貝爾芝士 (Camembert) 和 Queso Fresco 芝士。亦可向店員查詢這些芝士是否由經巴士德消毒的奶類製造。如有懷疑，不應食用。
- 如在家調製食物時需用到生蛋或半熟蛋，例如凱撒沙律醬料和意大利芝士蛋糕 (Tiramisu)，應使用經巴士德消毒的蛋或蛋製品。

# With / Without Pasteurisation?

