

Effective Learning and Teaching of Home
Economics / Technology and Living Series: Food
Preparation and Cooking Skills with Meal Planning –
Stuffing and Coating (Re-run)
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Topics

- Food and nutrition
- Meal pattern
- Recipe alteration / development
- Sensory analysis
- Time management for practical lessons
- Writing of time plan
- Types and function of coating
- Meal planning for Chinese one dish / two course / three course
- Nutritive value, choice, storage and uses of meat / poultry
- Effects of heat on meat / poultry (denaturation)
- Retention of nutrients of food
- Heat transfer
- Cooking methods
- Induction cooker

Food and nutrition

- Balanced diet is a key to stay healthy. Follow the "Healthy Eating Food Pyramid" guide as you pick your food. Grains should be taken as the major dietary source. Eat more fruit and vegetables. Have a moderate amount of meat, fish, egg, milk and their alternatives. Reduce salt, fat/oil and sugar. Trim fat from meat before cooking. Choose low-fat cooking methods such as steaming, stewing, simmering, boiling, scalding or cooking with non-stick frying pans. Also reduce the use of frying and deep-frying. These can help us achieve balanced diet and promote health.

http://www.chcu.gov.hk/eng/info/2plus3_12.htm

Food and nutrition



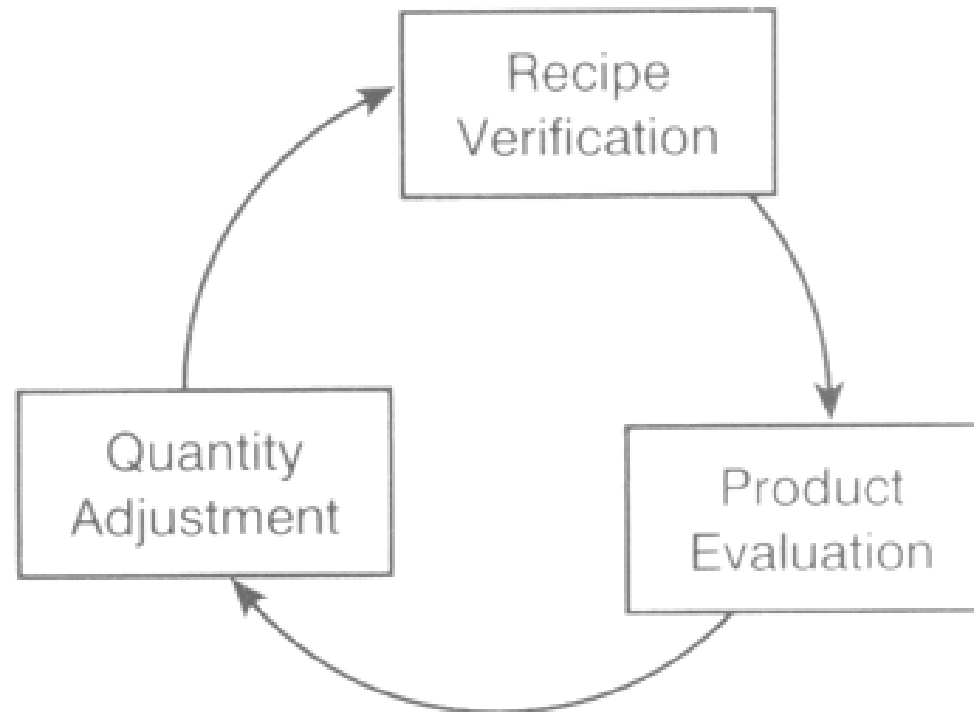
<http://www.cheu.gov.hk/eng/info/exercise.htm>

Meal pattern

- Breakfast
 - Breakfast is the first meal of a day. It gives us the energy to work for the whole morning. Breakfast is usually light and quick to prepare.
- Midday meal or lunch
 - Midday meal is usually a simple meal. Very often it is in the form of a one-dish / one course meal
- Evening meal
 - For most people, evening meal is the main meal of a day. It often includes two or more main dishes / courses

Recipe alteration / development

Recipe Standardization Cycle



Gregoire, M. B. & Henroid, D. (2002). Measuring success with standardized recipes. Washington, DC: USDA.

Sensory analysis

- When the quality of food is judged or evaluated by the senses (flavour, aroma, colour, and texture), it is said to be sensory evaluation.
- Flavour of food is affected by temperature, colour, and texture.

Sensory analysis

Procedures of sensory analysis

1. Preparation of Samples for Examination
2. Prepare palate cleanser. The goal of palate cleansers should be to aid in the removal of residual materials from previous samples.
3. Fill in the evaluation forms, or have students describe the sensory characteristics of food

Time management for practical lessons

- Allot time to demonstrate particular cooking skills:
 - Full demonstration
 - The entire recipe is prepared in front of the students
 - Split demonstration
 - The recipe is prepared in front of the students in segments
 - Spot demonstration
 - Only selected procedures of the recipe are demonstrated
- Work distribution between students, make sure they work within assigned time
- Time control – keep time and remind students how much time is remaining occasionally

Writing of time plan

- Format
 - Table format is easier to refer to
- Data required
 - Characteristics of the food being prepared
 - Major production steps involved
 - Time for each major production steps
 - Assign lag time to carry out washing up and tidying time
- Refer to handout on Time Plan

Types and function of coating

- Coating is the application of a layer of liquids or solids onto a product
- Coating is usually done for flavour and appearance enhancement, prevent agglomeration, and increase palatability, cost control, appearance
- Examples of types of coating:
 - Egg and cornflour / plain flour
 - Egg and breadcrumbs
 - Batter

Meal planning for Chinese one dish / two course / three course

- One dish meal
 - Main dish
- Two course meal
 - Main dish
 - Dessert
- Three course meal
 - Soup
 - Main dish (1)
 - Main dish (2)
 - Plain boiled rice

Nutritive value, choice, storage and uses of meat / poultry

- Meats and poultry are major sources of protein and Vitamin B. Meat also contains a large amount of iron.
- When choosing meats and poultry, choose the ones that are glistening and firm to touch, no foul smell
- Fresh meat and poultry should be refrigerated and should not be stored for periods longer than 3-4days
- Frozen meat or poultry are to be stored at -18 °C or below for up to 12 months
- To cook less tender cuts, it is best to use moist cooking methods like braising or stewing.
- Tender cuts of meat, such as beef tenderloin, can be prepared by roasting, broiling, pan-frying, or deep-fat-frying.

Effects of heat on meat / poultry (denaturation)

- The tender cuts of meat can become tough if they are cooked too long
- The more the muscle is heated, the more the protein draws up and becomes tighter, making it tough and difficult to eat

Retention of nutrients of food

- The cooking method, the cooking time, the presence of water, the presence of dripping (as in the case of meat and poultry), and the type of food (such as lean vs. fatty fish) all affect the amounts of vitamins and minerals retained in the final product
- Moisture may be lost through evaporation or drippings, or it may be gained through absorption, and hence making the nutritional profile concentrated or diluted
- Fat may be lost through drippings or gained through absorption during frying. Fat changes affect total weight, energy, total fat, fatty acids, and sometimes cholesterol, minerals, and fat-soluble vitamins

Heat Transfer

Objectives of Food Production

- Destruction of harmful microorganisms, thus making food safer for human consumption
- Increase digestibility
- Change and enhancement of flavour, form, colour, texture, and aroma

Heat Transfer

1. Conduction

- Transfer of heat through direct contact from one object or substance to another
- Transfer can occur in any of the three states: solid, liquid, or vapour
- Heat is transferred from a heat source (gas/electricity), through a cooking vessel to food

Heat Transfer

1. Conduction (cont'd)

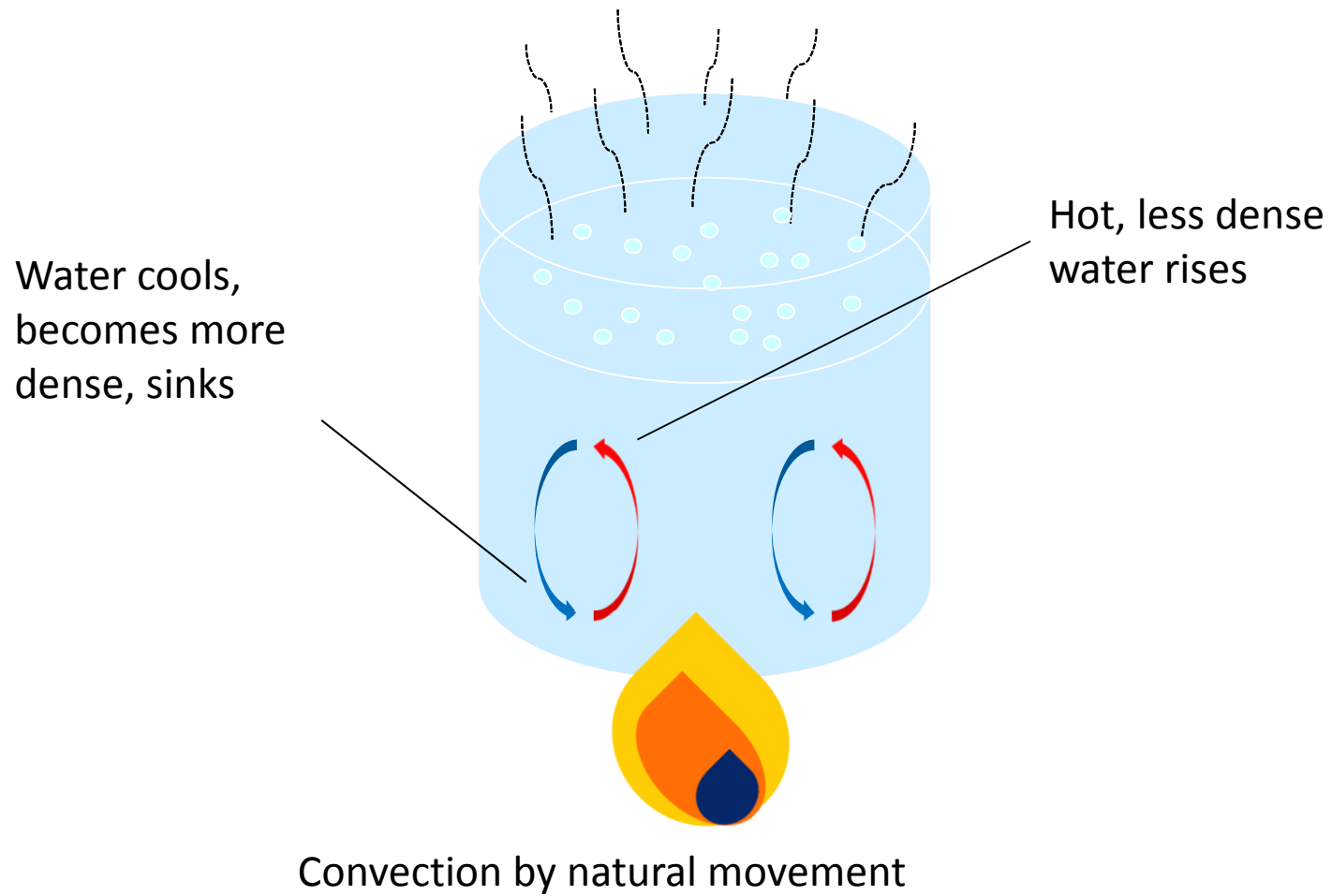
- Metal is a good conductor (copper, iron, and aluminum are effective conductor for cooking vessels; stainless steel is not as effective)
- Means of heat transfer in grilling, boiling, frying, and, to some extent, baking and roasting
- In some case, the cooking vessel is the conductor; while others, the fat (pan-frying) or water (boiling) are the conductor

Heat Transfer

2. Convection

- Distribution of heat by the movement of liquid or vapour; may be either natural or forced
- Natural movement: difference in density or temperature within a liquid or vapour (hot air rises, cool air falls; same thing as in liquid)

Heat Transfer



Heat Transfer

2. Convection (cont'd)

- Forced movement: caused by a mechanical device, for example:
 - Fan in convection oven or convection steamer to cause faster cooking
 - Reel oven with shelves that rotates food rather than air
 - Stirring action redistributes heat to prevent concentration of heat at the bottom of a container, and to prevent scorching and burning

Cooking Methods

Dry heat methods

- Heat is conducted by dry air, hot metal, radiation, or a minimum amount of hot fat
- E.g. roasting, baking, oven frying, broiling, grilling, barbecuing, rotisserie cooking, frying sautéing, pan frying, and deep fat frying
- Equipment: broiler, charbroiler, rotisserie, deep fat fryer, oven (range oven, deck oven, convection oven, conveyor oven, microwave oven, smoker oven, and combi-oven), tilting skillet, and convection/microwave oven

Cooking Methods

Moist heat methods

- Involve the use of water or steam for the cooking process
- E.g. boiling, simmering, stewing, poaching, blanching, braising, and steaming
- Equipment: steam-jacketed kettle, pressure steamers, pressureless convection steamer

Cooking Methods

- **Deep-frying**
 - Food is submerged in hot fat
 - Cooks foods quickly, all sides of a food are cooked simultaneously as oil has a high rate of heat conduction
 - High caloric consumption
 - Fire hazard, environmental concern (gas and waste)
- **Shallow-frying**
 - To cook in small amount of fat, also called pan-frying
- **Stir-frying**
 - A Chinese cooking technique in which ingredients are fried in a small amount of oil while being stirred in a wok
- **Baking**
 - To cook in an oven or oven-type appliance
- **Grilling**
 - To cook by direct heat
 - Significant amount of direct, radiant heat, and tends to be used for cooking meat quickly
 - Can lead to the formation carcinogens

Induction cooker

- Use of electrical magnetic fields to excite the molecules of metal cooking surfaces
- Cook magnetically
- The burner surface does not get hot
- Molecules in the pan are activated which produce the heat to cook food
- Induction heat is fast, even, and clean, and the units do not require ventilation

Q&A

家政科/ 科技與生活科有效的學與教系列：

處理和烹調食物的技巧與膳食計畫－
釀法和蘸料 (重辦)

2016 年2月19日

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內容

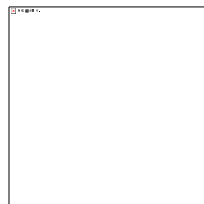
- 食物及營養
- 膳食模式
- 食譜修改/研製
- 食品感官分析
- 實習課的時間管理
- 撰寫時間表
- 蘸的種類和功能
- 中式一款菜式／兩款菜式／三款菜式的膳食計畫
- 肉類/家禽的營養價值、選擇、用途和存儲
- 熱力對肉類/家禽的影響（變性）
- 食物的營養成分的保留
- 傳熱
- 烹調方法
- 電磁爐

食物及營養

- 均衡飲食是維持健康的要素，我們應依照「健康飲食金字塔」的原則飲食，以穀物類為主，並多吃蔬菜及水果，進食適量的肉、魚、蛋和奶類及其代替品，減少鹽、油、糖分；並以去肥剩瘦，多採用低油量的烹調方法如蒸、燉、炆、焗、白灼等或用易潔鑊煮食，及減少煎炸，以求達致飲食均衡、促進健康。

http://www.cheu.gov.hk/b5/info/2plus3_12.htm

食物及營養



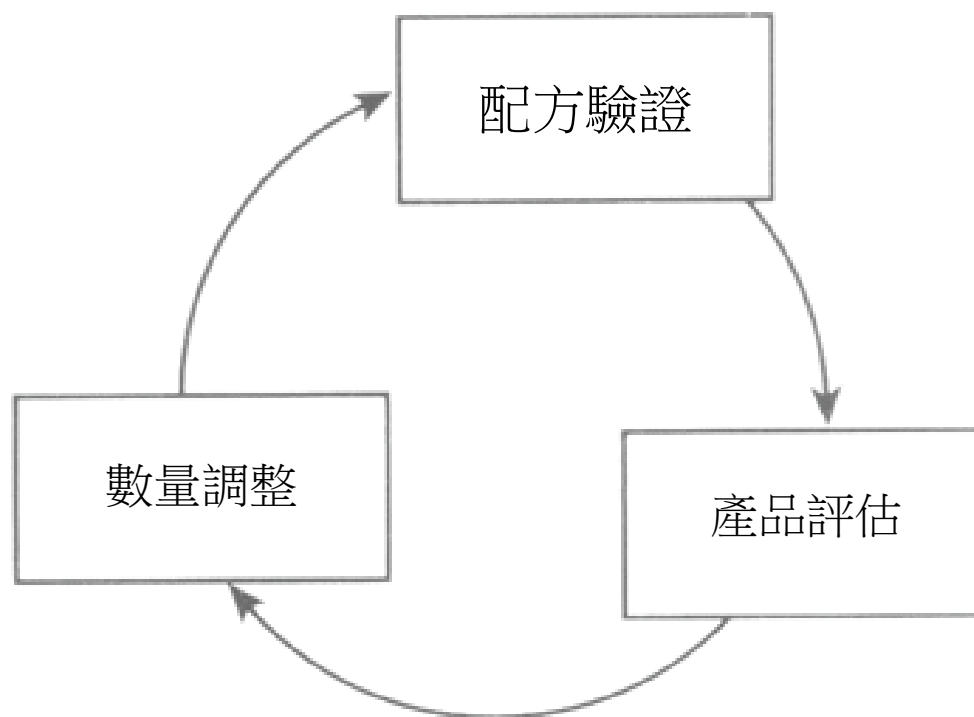
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膳食模式

- 早餐
 - 早餐是一天中的第一頓餐。它為我們提供能量，以應付一整個上午的工作。早餐通常是輕便，容易準備的。
- 午餐
 - 午餐通常是簡單的膳食。很多時候是在一款菜式的膳食
- 晚餐
 - 對於大多數人來說，晚餐是一天的主餐。它通常包括兩款或以上的主菜

食譜修改/研製

配方標準化週期



Gregoire, M. B. & Henroid, D. (2002). Measuring success with standardized recipes. Washington, DC: USDA.

食品感官分析

- 當食品的質量被判斷或通過感官（味道，香氣，顏色和質地）來評價，它被說成是食品感官評估。
- 食物的味道是受溫度，顏色和質地所影響。

食品感官分析

感官分析程序

1. 準備測試的樣品
2. 準備口腔清潔劑，口腔清潔劑的目的是幫助去除之前樣品的殘餘材料
3. 填寫評估表，或者讓學生形容食物的感官特性

實習課的時間管理

- 分配時間來示範特定的烹飪技巧：
 - 完整的示範
 - 在學生面前製作整個配方
 - 拆分的示範
 - 配方是分段在學生面前製作
 - 局部的示範
 - 只示範選擇了的程序
- 在學生之間分配工作，確保他們在指定的時間內工作
- 時間控制 – 留意時間，並偶爾提醒學生剩餘多少時間

撰寫時間表

- 格式
 - 表的格式較容易參照
- 所需的資料
 - 準備製作的食物的特性
 - 涉及的主要生產步驟
 - 每個主要生產步驟所需的時間
 - 分配中段時間進行清洗和整理
- 請參閱時間表的講義

蘸的種類和功能

- 蘸是把一層液體或固體應用到產品上
- 蘸通常用於風味和外觀改進、防止結塊、並增加可口性、成本控制和外觀
- 蘸的類型的例子：
 - 雞蛋和粟粉/麵粉
 - 雞蛋和麵包糠
 - 麵糊

中式一款菜式／兩款菜式／三款菜式的膳食計畫

- 一款菜式的膳食
 - 主菜
- 兩款菜式的膳食
 - 主菜
 - 甜品
- 三款菜式的膳食
 - 湯
 - 主菜 (1)
 - 主菜 (2)
 - 白飯

肉類/家禽的營養價值、選擇、用途和存儲

- 肉類和家禽是蛋白質和維他命B的主要來源，肉類也含有大量的鐵質。
- 應選擇有鮮肉光澤及略有彈性的肉類和家禽，不應有異味
- 新鮮肉類和禽類應冷凍，並且不應貯存長於**3-4日**
- 冷藏肉類或家禽可以儲存在攝氏**-18度**或以下長達**12個月**
- 烹煮不太幼嫩的部分，最好是用濕熱法，如紅燒法或燜法。
- 肉類幼嫩的部分，如牛肉里脊，可以通過燒焗、烤、煎或油炸。

熱力對肉類/家禽的影響（變性）

- 如果烹調時間過長，幼嫩的肉類可以變得堅韌
- 肌肉越加熱得多，蛋白質越绷紧，並變得更紮實，使它堅韌和難以進食

食物的營養成分的保留

- 烹調方法、烹調時間、水的存在、滴出的汁液（肉類和禽類的情況）、以及食品的類型（如瘦與肥的魚），都影響保留在最終產品內的維他命和礦物質份量
- 水分可通過蒸發或汁液流失，或者可以透過吸收而獲得，並因此導致營養成分濃縮或稀釋
- 脂肪可以通過汁液流失或在油炸過程中吸收而獲得。脂肪的變化會影響總重量、能量、總脂肪、脂肪酸、甚至膽固醇、礦物質和脂溶性維他命

傳熱

食品生產的目標

- 毀滅有害微生物，從而使供人食用的食品更安全
- 提高消化率
- 變化和增強香味、形態、顏色、質地和香氣

傳熱

1. 傳導

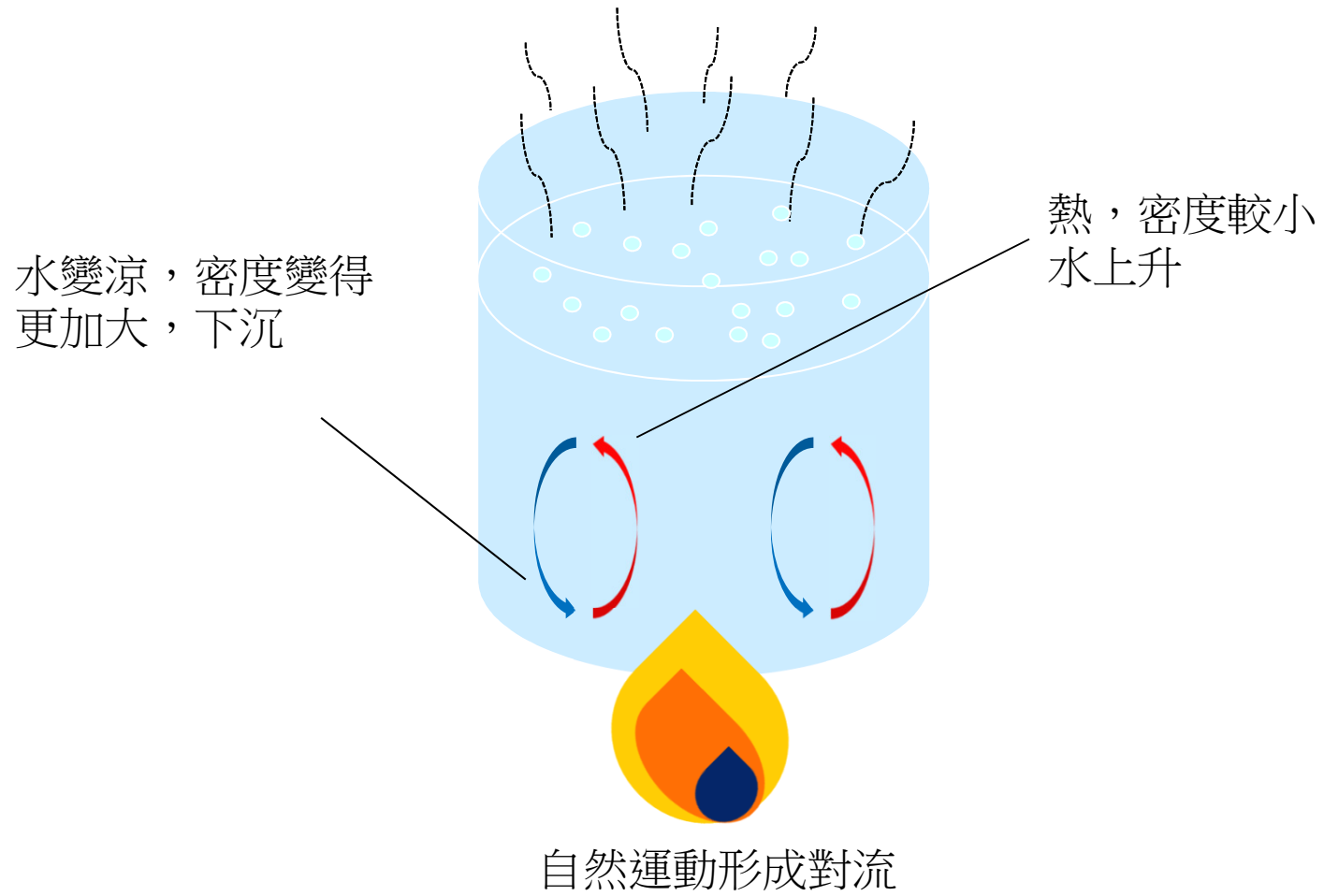
- 一件物件通過直接接觸另一件物件，而傳送熱力
- 熱力傳送可以以任何的一種狀態發生：固體、液體或蒸氣
- 熱力是從熱源（氣體/電力），通過一個烹調容器，傳送到食物
- 金屬是一種優良導體（銅、鐵和鋁的烹調容器是有效的導體對；不銹鋼並不很有效）
- 烘、煲、煎及一定程度上，焗和燒就是用這方法傳熱
- 在一些情況下，烹調容器是導體；而另一些情況下，脂肪（煎）或水（煲）是導體

傳熱

2. 對流

- 熱力的分佈是透過由液體或蒸汽的流動；可以是自然或強迫的
- 自然對流：在液體或蒸氣內部有密度或溫度差異（熱空氣上升，冷空氣下降；在液體中也是一樣）

傳熱



傳熱

2. 對流（續）

- 強迫對流：由機械裝置引起，例如：
 - 對衡式焗爐或蒸爐內的風扇導致更快的烹調
 - 旋轉焗爐內的架子轉動，而不是空氣轉動
 - 攪拌動作把熱力均勻分佈，以防止熱力集中在容器的底部，並防止燒焦和焦化

烹調方法

幹熱法

- 熱力通過空氣乾燥、熱金屬、輻射或少量熱脂肪而傳導
- 例如燒、焗、煎烤、烘、燒烤、旋轉烤法、爆炒、煎、炸
- 設備：烘爐、碳燒烘爐、旋轉烤爐、油炸鍋、焗爐（爐頭焗爐、分層焗爐、對衡式焗爐、運輸帶焗爐、微波爐、煙燻焗爐和兩用爐）、傾斜煎鍋、和對衡式/微波爐

烹調方法

濕熱法

- 涉及使用的水或蒸汽進行烹調
- 例如煮、文火煮、燜、浸熟、氽水、紅燒和蒸
- 設備：蒸汽夾層鍋、壓力鍋、對衡式蒸爐

烹調方法

- 炸；油炸
 - 將食物浸在高溫的食用油中，透過油的高溫給食物加熱
 - 烹調速度很快，食物的四面八方同時煮熟，因為食油的傳熱效率高
 - 高熱量的攝取
 - 火災危險性，環境問題（氣體和廢棄物）
- 煎
 - 用少量脂肪烹調
- 炒
 - 在鍋內加微量的食油，放入材料後顛翻至熟
- 焗
 - 在焗爐或烤箱內烹調
- 烘；烤
 - 通過直接熱進行烹調
 - 通常使用顯著大量的直接輻射熱，以期快速烹調食物
 - 可導致形成致癌物質

電磁爐

- 使用的電磁場激發烹調器皿表面的金屬分子
- 用磁場烹調
- 爐具表面不會變熱
- 在鍋裡分子被激活，產生的熱量烹調食物
- 電磁熱力是快速、均勻、清潔和裝置不需要通風

Q&A