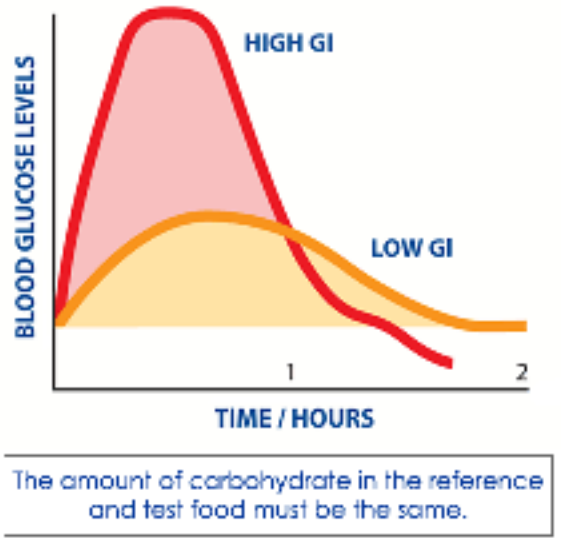
Diabetes diet & Healthy diet

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31st May 2016

Talk Overview

- Risk of Diabetes
- Goals of Medical Nutrition Therapy
- Four pronged approach
  - Assessment
  - Goal setting
  - Nutritional intervention
  - Patient empowerment
- What is Glycemic Index (GI)?
  - Factors affecting GI
- Alternative Sweetener



Risk of Diabetes

- Family History
- Age
- Overweight
- Lack of Exercise
- Lifestyle changes
- Disease of Pancreas
- Medications and other Endocrine problems
- History of GDM

Goals of Medical Nutrition Therapy

- Attain and maintain optimal metabolic outcomes
  - Blood Glucose
  - Lipid Profiles
  - Blood Pressure
- Prevent and treat the chronic complications of diabetes
- Improve health via healthy food choices and physical activity
- Address individual nutritional needs

Four-pronged Approach

- Assessment
- Goal setting
- Nutritional intervention
- Patient empowerment



Assessment

- Biochemical
  - FBS, HbA1c, lipid profile, renal and liver function
- Anthropometric
  - Body weight, height, body mass index (BMI), body fat %
- Intake Assessment
  - Type, amount of food intake, food habits, lifestyle, activities, pyschosocial issues
- Comprehension level
  - Literacy, education level, age



Body Mass Index (BMI)

Asian BMI	Category
<18.5	Underweight
18.5-22.9	Normal
23-24.9	Overweight
25-29.9	Obese
>30	Morbid obese

•World Health Organization (WHO, 2004) proposed normal BMI as 18.5-24.9 for General population. However, BMI between 23-24.9 with increased risk of chronic diseases



BMI and Desirable body weight calculation

BMI = body weight (kg) ÷ body height (m^2)

Ex: BMI = 60/1.6/1.6 = 23.4 kg/m^2

Desirable body weight (DBW or IBW)
= 1.6m x 1.6m x 18.5 (lower range) = 47.3
= 1.6m x 1.6m x 23.0 (upper range) = 58.9

IBW for an individual with 1.6m: 47 – 59kg

Nutritional Prescription

- Energy level
  - Sedentary DBW x 25-30
  - Moderate DBW x 30-35
  - Heavy DBW x 35-40
  - Obese DBW x 20-25
    - Or current energy intake minus 250-500kcal per day



Goal Setting

- Patient involvement
- Specific-target
- Promote positive changes
- Realistic

Nutritional Intervention

- Complex issues to consider:
  - Eating habit, socioeconomic status, working hours, lifestyle, education level, other medical problems or underlying complications etc
- Nutritional prescription
- Individualized meal plan formulation



DIET EDUCATION

飲食金字塔 Food Pyramid

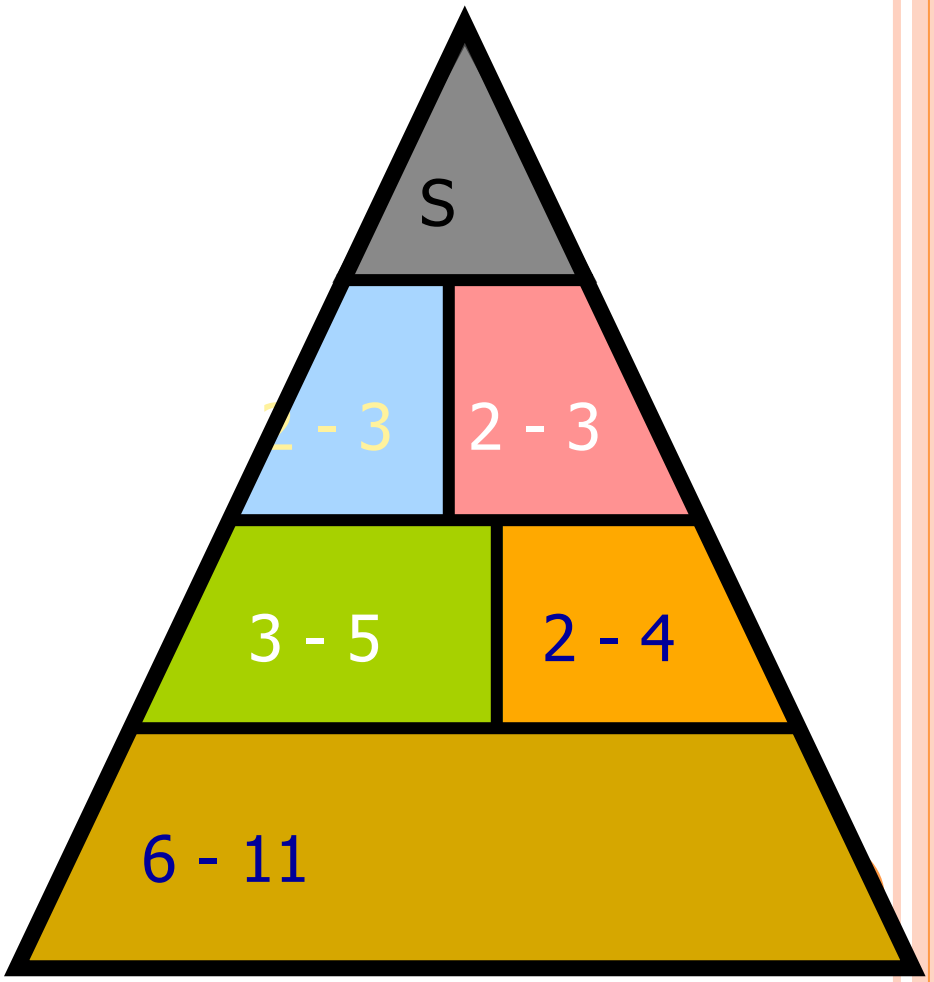
碳水化合物計算法 Carbohydrate Counting

升糖指數 Glycemic Index

食物標籤 Food Label

Diabetes Food Pyramid





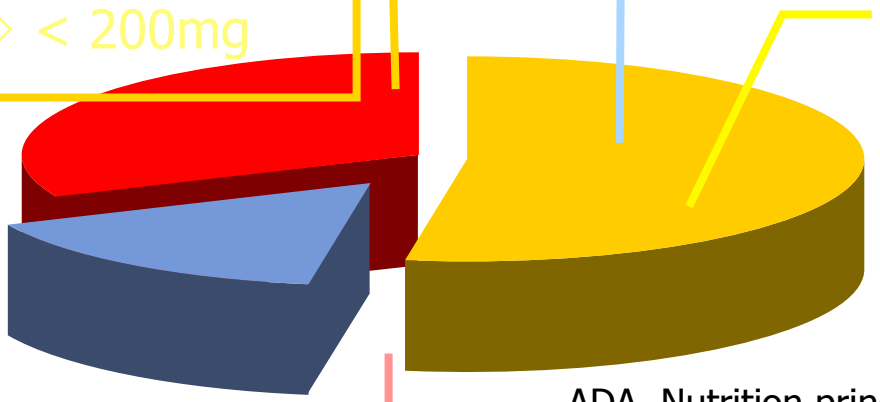
DM Nutrition at a Glance

CHO & Monounsaturated fats ⇨ 60 – 70%

Total Fat ⇨ 25 – 35 %
- •SFA ⇨ < 7%
- •PUFA ⇨ < 10%
- •MUFA ⇨ 10 – 15%
- •Minimize Trans Fat

•Cholesterol ⇨ <300 mg
•If LDL >2.6 ⇨ < 200mg

•CHO only ⇨ 45 – 60 %
- •> 130g
- •Sucrose ⇨ < 10%
- •Fiber ⇨ Encouraged



- Individualized meal plan
- 3-6 meals / day
- Weight Control

- Na^+ ⇨ < 2400 mg

Protein ⇨ 10 – 20 %
- •> 0.8 g/kg BW HQP
- •0.8 g/kg BW for CKD

ADA, Nutrition principles and recommendations in diabetes, Diabetes Care 27 (2004) S36–S46.

ADA, Standard of Medical Care, Diabetes Care 29 (2006) S4-S42

DNSG of the EASD, Recommendations for the nutritional management of patients with diabetes mellitus,Eur. J. Clin. Nutr. 54 (2000) 353–355.

Nutritional Prescription

- Carbohydrate (CHO): 45-60% of total energy

(Obese 35-40% with minimum 175g CHO per day)

  - Lower total amount CHO
  - Lower glycemic index (GI) / load (GL)
  - Nutrient dense CHO
  - Increase fibre
  - CHO distribution
  - Consistent intake

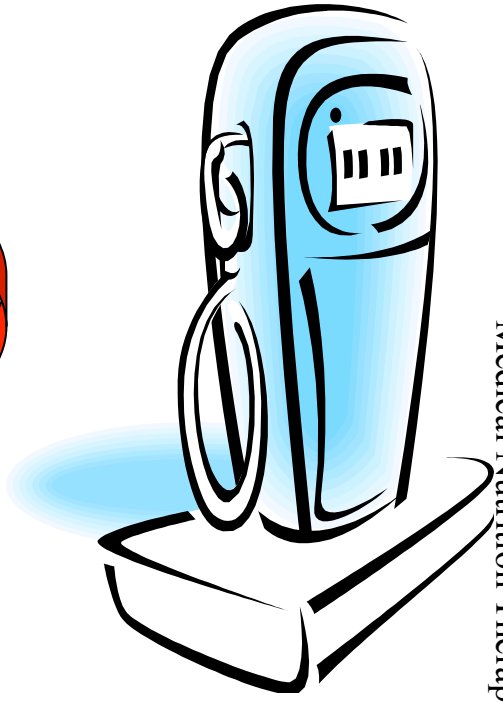
ADA Position statement

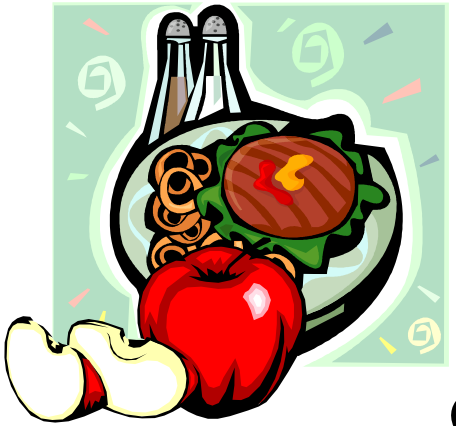


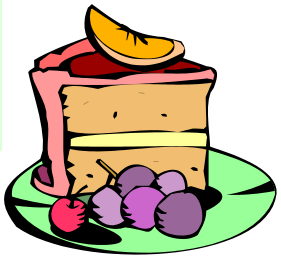
NUTRIENTS

- Carbohydrate > > > > > 100%
- Fiber
- Protein
- Fat

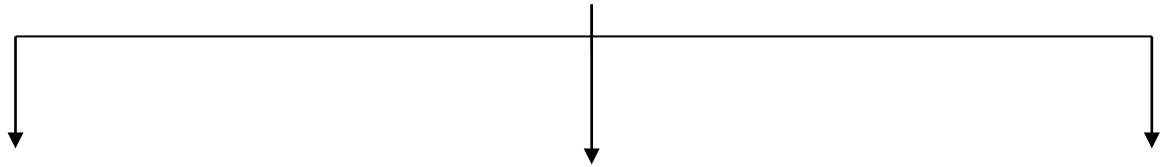
Blood Glucose







碳水化合物
CARBOHYDRATE



糖類	澱粉質	纖維
Sugar	**Starch**	**Fibre**
蔗糖 Sucrose	飯 Rice	蔬菜 Vegetables
果糖 Fructose	麵包 Bread	瓜類 Melons
葡萄糖 Glucose	薯仔 Potatoes	菇類 Mushroom

Foods Containing CHO

- **Grains**
  - Rice, Noodles, Pastas, Congees
  - Breads, crackers
- **Fruits / Fruit Juices**
- **Starchy Vegetables**
  - Potatoes, Yams
  - Taro, pumpkins
  - Carrots, Corns
- **Sweets & Pastries**
  - **Cookies, cakes**
  - **Sweet soups**
  - **Ice cream, puddings**

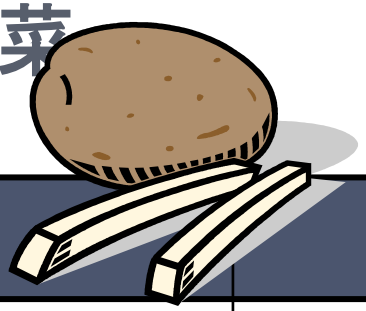
- **Milk & Yogurt**
  - Milk, yogurt
  - Calcium fortified soymilk
- **Dried beans**
  - Chestnuts
  - Beans, peas, lentils
  - Cellophane noodles
- **Soy products**
  - Dried Tofu
  - Soybeans

五穀類

醣質	蛋白質	脂肪
10 克	1-2 克	0-1 克

食物	簡易份量
飯	1 滿湯匙或 1/5平中號碗
粥（杰）	1/2 碗
潮州粥	1/4 中號碗
米粉（熟）	1/4 碗
通粉（熟）	1/3 碗
麥包（嘉頓）	去薄邊半塊（大）
麥皮（生）	2 湯匙
消化餅	1 塊
高纖維麥餅乾（Provita）	3 塊

高澱粉質蔬菜



醣質 10 克	蛋白質 1 克	脂肪 0 克

食物	簡易份量
焓薯仔（去皮）	 1 個細雞蛋體積
蕃薯（生）黃肉	
芋頭（生）	
紅蘿蔔	  2 個細雞蛋體積
蕃瓜（生）	
馬蹄	4 粒去皮（大）
熟栗粒	3 平湯匙

豆類



醣質	蛋白質	脂肪
10 克	1 克	0 克

食物	簡易份量
鮮栗子（去殼）	2 粒（大）
紅/綠豆	2 滿湯匙（熟）
粉絲	半碗（濕）
青豆乾	2 平湯匙（熟）
青豆	4 平湯匙（熟）
黑豆	4 平湯匙（熟）
茄汁豆	4 平湯匙（熟）

奶類



醣質
10 克

蛋白質
7 克

脂肪
0-7 克

食物	簡易份量
全脂/ 低脂 / 脫脂奶粉	4 平湯匙
全脂/ 低脂 / 脫脂鮮奶	210 毫升
全脂淡奶 / 低脂淡奶	6 湯匙
純味酸乳酪	160 毫升
淡豆漿	210 毫升
低糖加鈣豆漿	200 毫升
豆奶粉	2 平湯匙

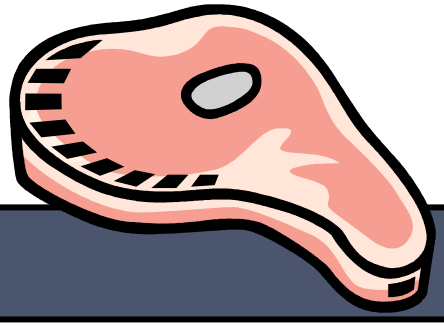
生果



醣質	蛋白質	脂肪
10 克	0 克	0 克

食物	簡易份量
萍果	1 個細
梨	1 個細
橙	1 個中型
桃	1 個中型
沙田柚	2 件
木瓜	1/4 個（每只14 cm長）
蕉	1/2 隻
提子	10 粒（細）
鮮橙汁	1/2 杯

肉類



醣質	蛋白質	脂肪
0 克	7 克	0-8 克

食物	簡易份量
新鮮或急凍 豬、牛、羊、雞、鴨、鵝 （生、淨肉）	40 克
雞蛋	A 級 1 隻
魚柳（生）	一件（6 × 5.5 × 1 cm）
蝦（生）	4 隻（7 cm）免殼
火腿	一片（16 × 9.5 cm）
龍蝦（淨肉）	40 克
芝士 / 低脂芝士（切片）	1 1/2 塊

Carbohydrate Counting

To evenly distribute total CHO in diet.

Daily CHO Allowance
200 g

Brkfst	Lunch	PM	Dinner	Night
40-50 g	50-60 g	15-20g	50-60 g	10-15g

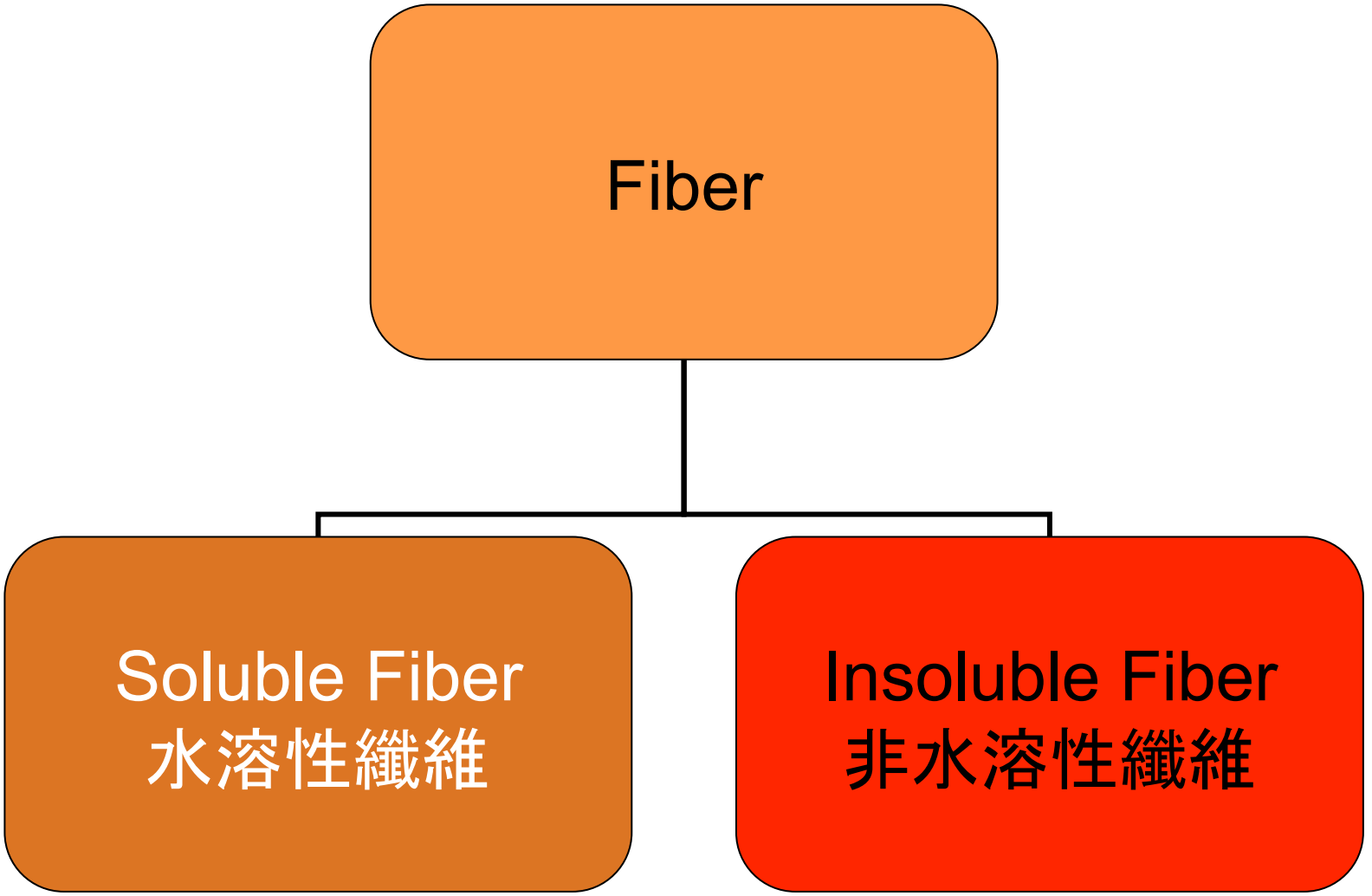
200 g total

Fibre (18-25g per day)





Fiber



Insoluble Fiber 非水溶性纖維

- Roughage!
- Aid in digestion
- The structure of plant cell walls
- Nature's broom
- Add bulk / softness to stool
- Prevent constipation, hemorrhoids, diverticulosis
- Decrease transit time
- Decrease potentially harmful substances in food waste linger in the intestines

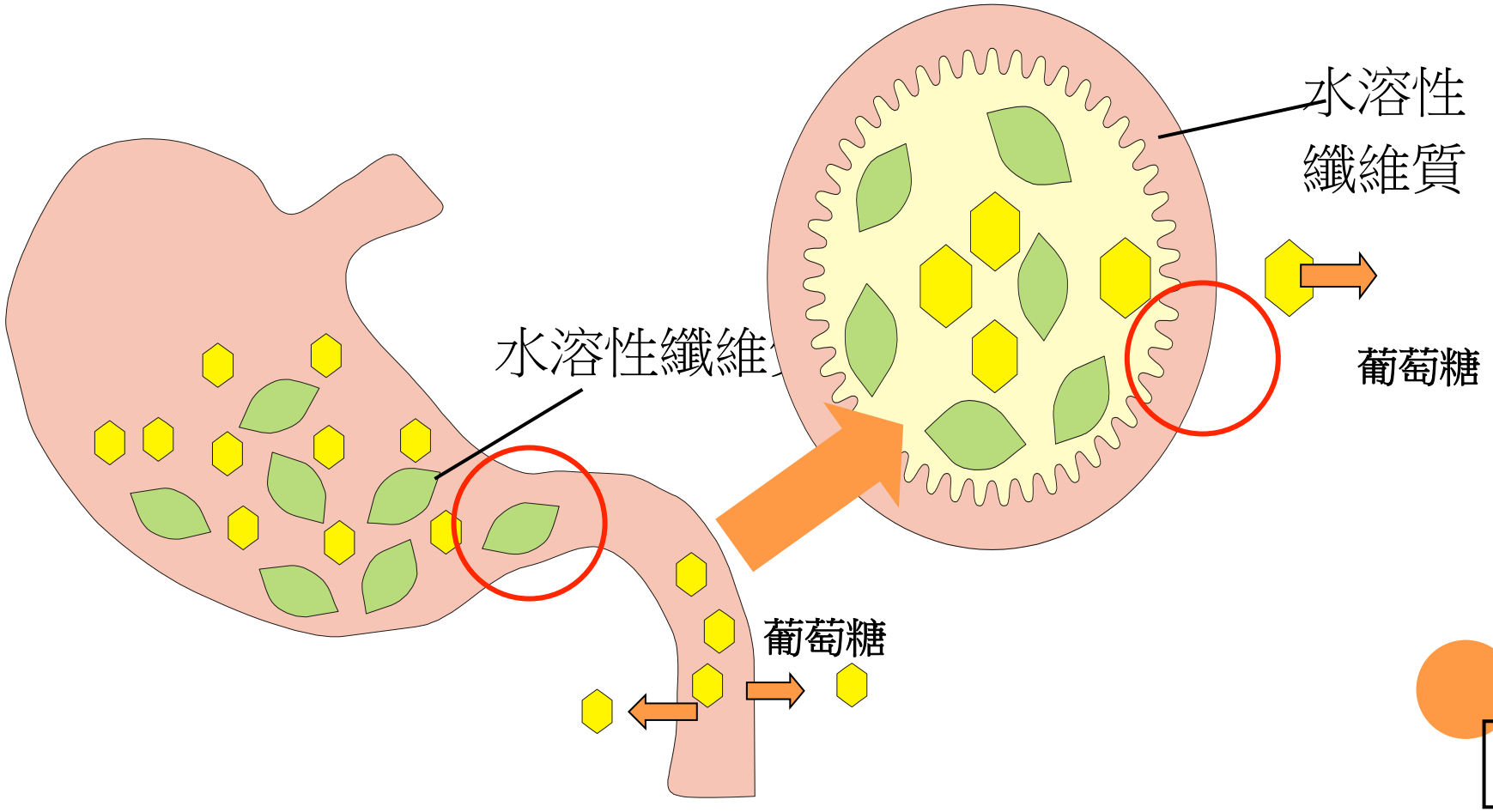
Soluble Fiber 水溶性纖維

- In soft liquid foods
- the fiber in oats and beans
- Form a gel consistency
- Helps to lower LDL cholesterol
- lower GI, helps to control
  - Blood sugar level
  - Triglyceride
  - Weight

K

水溶性纖維質

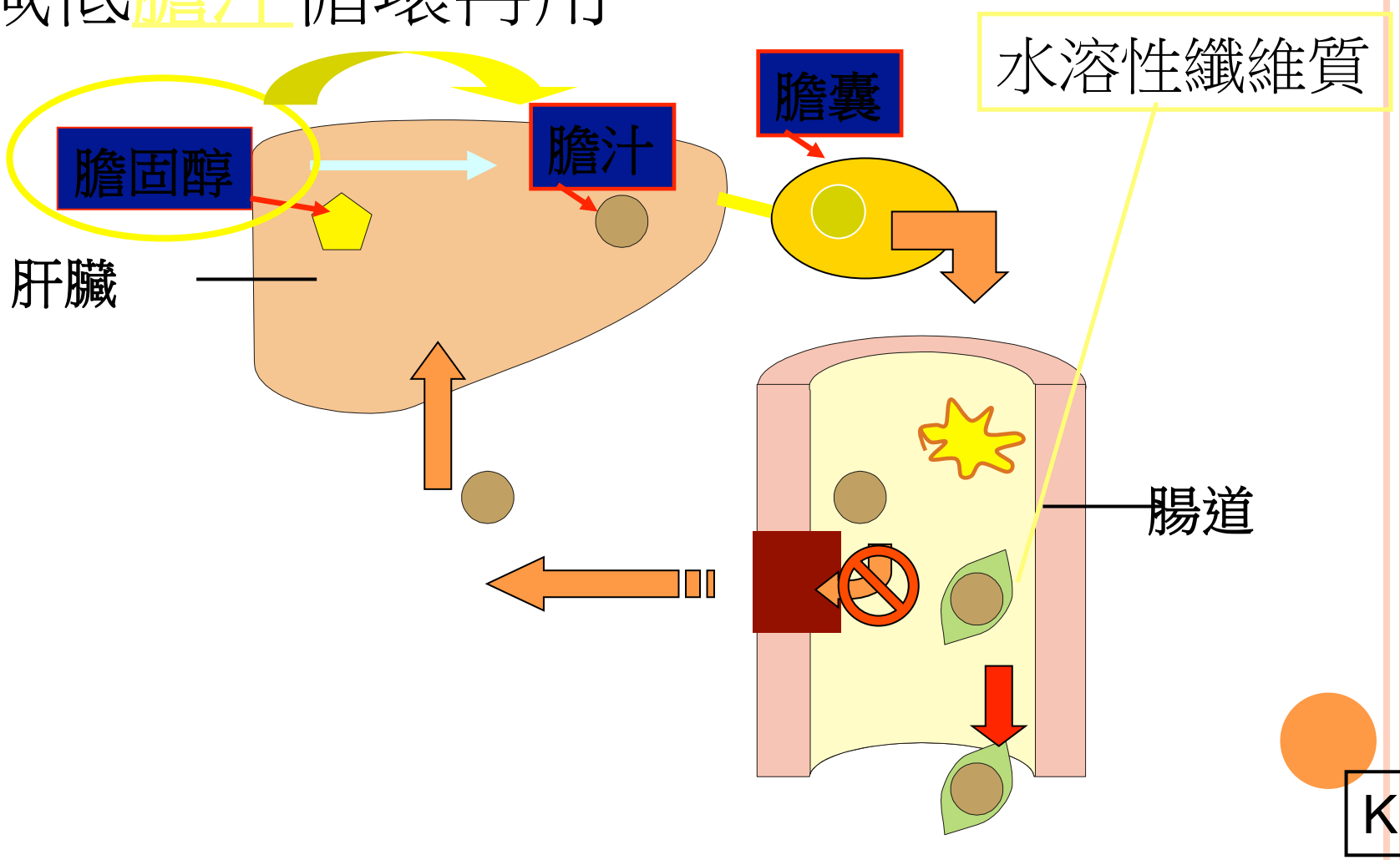
-減慢胃部掛空時間及葡萄糖吸收



K

水溶性纖維質

-減低膽汁循環再用



K

Fiber

- Soluble Fiber
  - Oats (2.2g/0.75cup)
  - Purple passionfruit (6.5g/ 0.5cup)
  - Orange (1.8g/medium size)
  - Carrot (1.7g/0.5cup)
  - Psyllium seed husks (3.5g/ tbsp)
  - Metamucil (3.4g/tbsp)
  - Tofu (2.8g/0.75cup)
  - Avocado (2.1g/0.5cup)
  - Kidney beans (2g/0.5cup)
  - Sweet potato (1.8g/0.5cup)
  - Asparagus (1.7g/0.5cup)
  - Flaxseeds (2.2g/tbsp)
  - Dried figs (1.9g/0.25cup)
- Insoluble Fiber
  - All bran cereal (7.2g/0.3cup
  - Wheat bran (11.3g/0.5cup)
  - Shredded wheat (4.5g/cup)
  - Green pea (3g/0.5cup)
  - Okra (3.1g/0.5cup)
  - Flaxseeds (2.2g/tbsp)
  - Kidney beans (5.9 g/0.5cup)
  - Lentils (4.6 g/0.5cup)



Proteins 蛋白質

- Made of amino acids
- Build, repair and maintain your body tissues
- Provide energy when CHO and fats are short in supply
- Nonessential amino acids vs. essential amino acids
- 4 kcal / gram

K

Proteins 蛋白質

動物性 vs 植物性

我們從哪些食物可以吸收蛋白質呢？

蛋白質分為動物性及植物性，動物性來源例如豬、牛、雞、羊、魚、奶、蛋等，一般都有齊八種人體必需氨基酸；植物性蛋白質如豆類、果仁類、五穀類，雖然未必有齊八種人體必需氨基酸，但由於含纖維及維他命，而且沒有動物性脂肪，故從植物中吸收蛋白質亦是一個好方法。





◀▲肉類和植物都會有蛋白質，均衡地攝取最健康。

K

Amino Acids

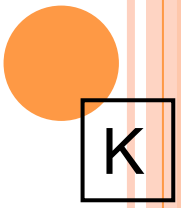
- Essential AA
  1. Phenylalanine
  2. Valine
  3. Threonine
  4. Tryptophan
  5. Isoleucine
  6. Methionine
  7. Leucine
  8. Lysine

- Conditionally Essential AA
  1. Arginine
  2. Cysteine
  3. Glycine
  4. Glutamine
  5. Histidine
  6. Proline
  7. Serine
  8. Tyrosine



Protein Needs

- Adult: 0.8-1.0 g / kg body weight
  - Male: 56 g / Female: 46 g
  - ~ 10- 20% total kcal
- Pregnancy + 10 g / day
- Renal
  - Predialysis 0.6 – 0.8 g / kg BW
  - Hemodialysis 1.1-1.4 g / kg BW
  - Peritoneal dialysis 1.2-1.5 g / kg BW
- Liver
  - Hepatitis 1-1.5 g / kg BW
  - Cirrhosis 1-1.8 g / kg BW
  - Encephalopathy 0.5-1.2 g / kg BW
- Cancer
  - General 1-1.2 g / kg BW
  - Cachexia 1.2-1.5 g / kg BW



一兩肉　7克蛋白質

包裝食物有食物營養標籤，上面會註明蛋白質含量，但我們從鮮肉中吸收蛋白質，怎計算當中的蛋白質含量呢？

肉類大約有20%為蛋白質，80%為水分，即100克肉大約有20克蛋白質。以此計算，男士每日可吃約300克肉類，女士可吃230克肉類。

另外，大家亦可以一兩肉（約一隻麻雀大小）含有7克蛋白質計算，即如果男士每日要52克蛋白質，即大約是七兩肉，女士則需六兩肉。

「肉類、魚和雞蛋，含有最多的蛋白質，粥、粉、麵、飯也含有少量蛋白質，但由於後者的蛋白質含量少，所以營養師一般不會將其計算在內。」



余思行提醒，雞蛋、奶類產品、豆類都含豐富蛋白質，故計算每日吸收量時，亦需將這些食物計算在內。

◀一份8安士牛扒所含蛋白質足夠男士每日所需。

蛋白質含量表

食物	份量	蛋白質(克)
牛奶	1杯(240毫升)	8
豆漿	1杯(240毫升)	8
豬、牛、羊	40克(1兩)	7
雞、鴨、火雞	40克(1兩)	7
魚	40克(1兩)	7
蛋	1隻	7
黃豆	4大湯匙(熟)	7
白飯、糙米飯	1碗	5
麵包	1片	2



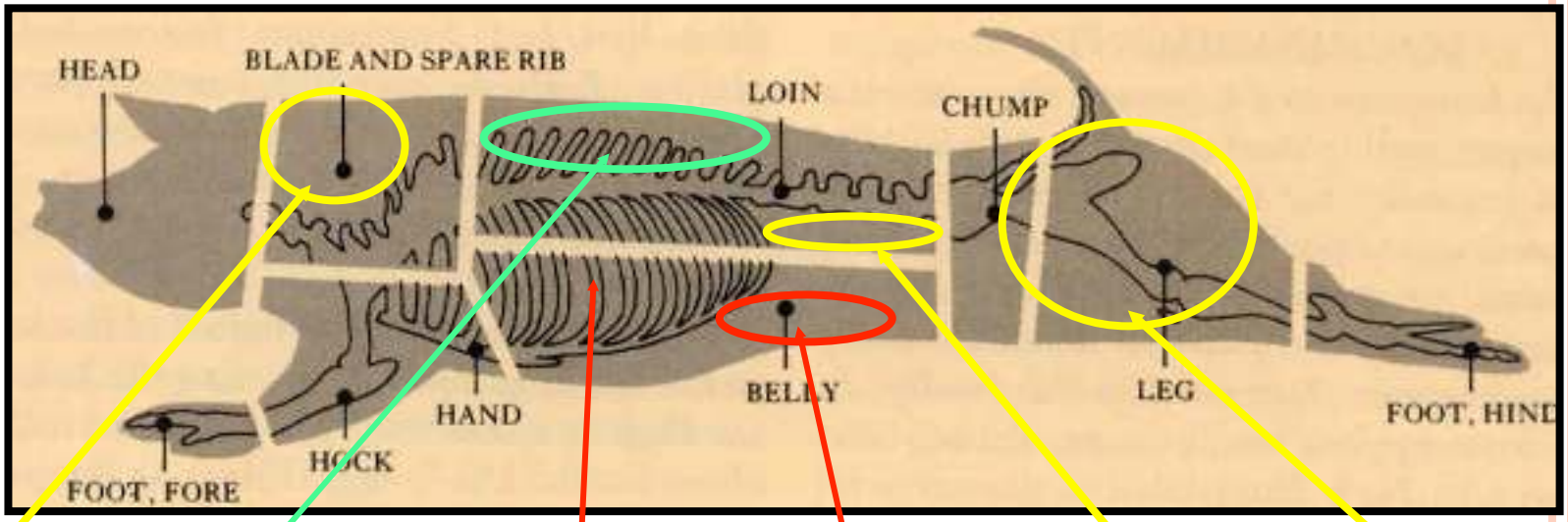
K

豬肉

炒

蒸

炆





梅頭
脂肪:8克

豬扒
脂肪:8克

腩排
脂肪:24克

五花腩
脂肪:34克

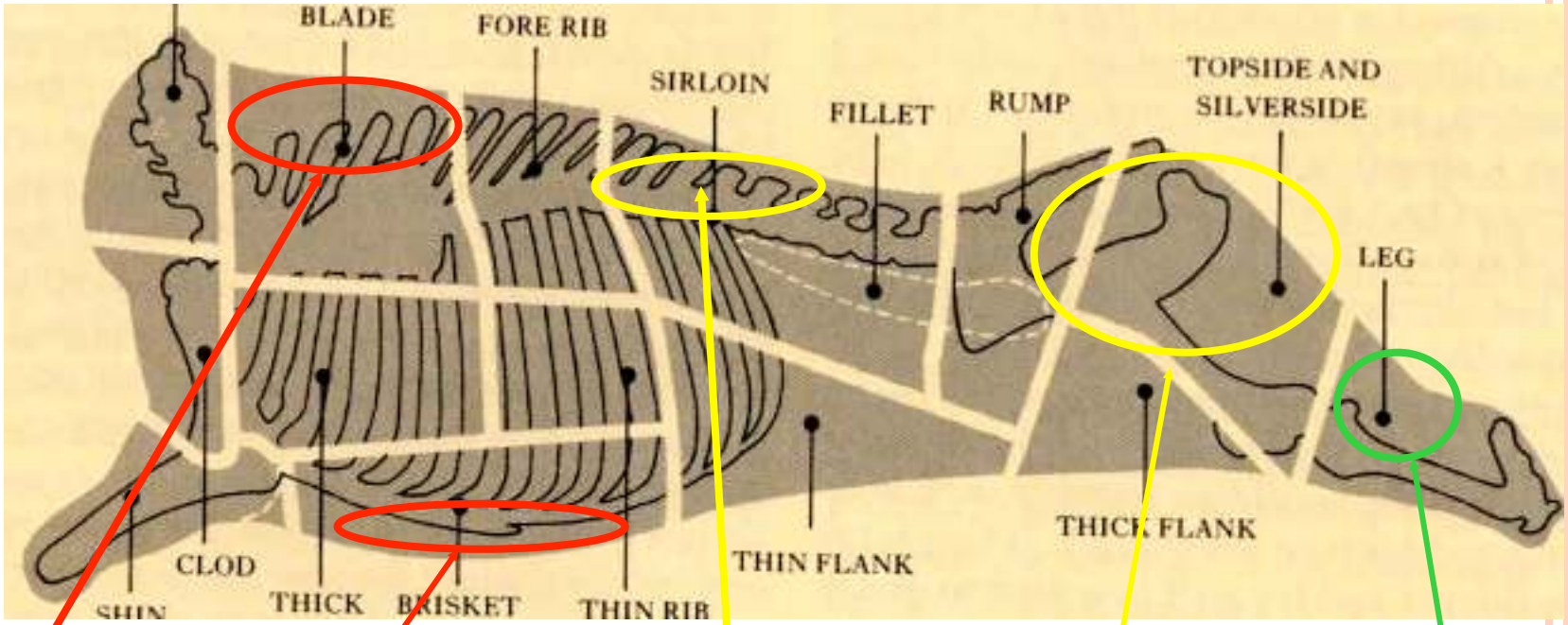
柳梅
脂肪:3克

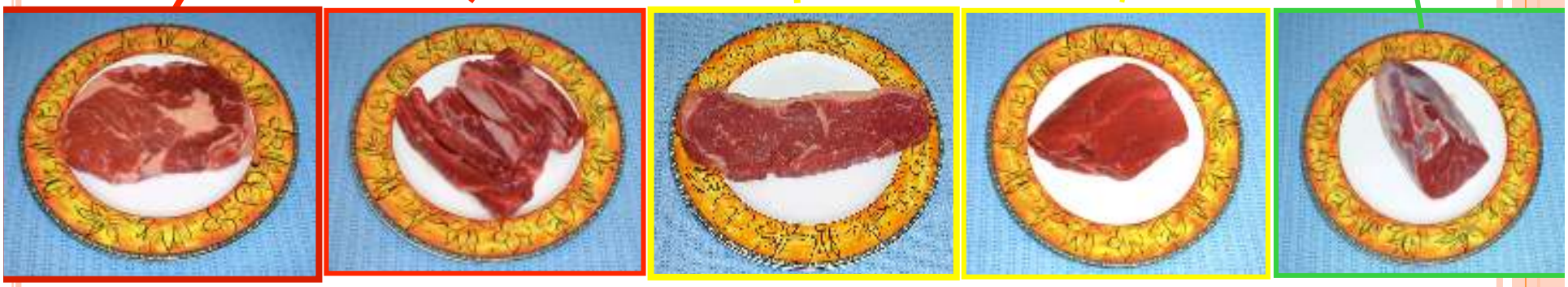
赤肉
脂肪:5克

每2-3兩脂肪量

牛肉

炒
蒸
炆





肉眼
脂肪:16克

牛腩
脂肪:26克

西冷
脂肪:8克

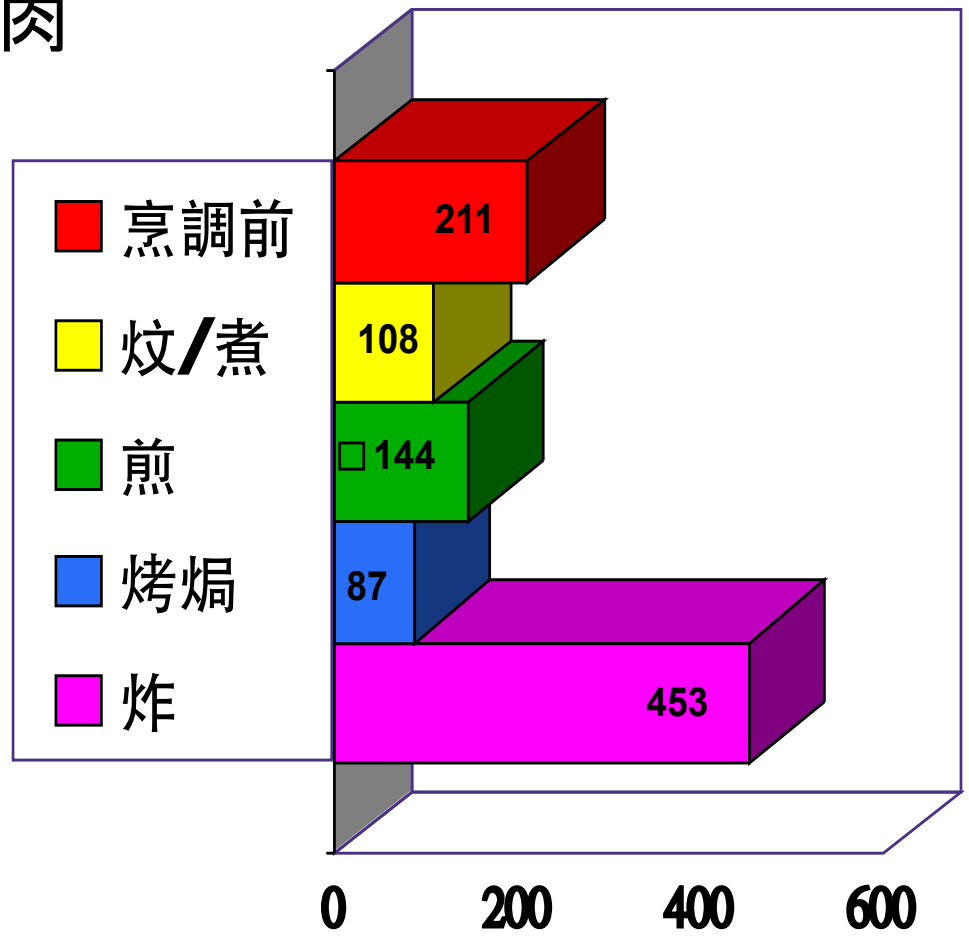
牛菉
脂肪:4克

牛展
脂肪:11克

每 2-3兩脂肪量

烹調方式

雞脾肉





雞胸肉(去皮)
脂肪:3克



雞脾連皮
脂肪:12克



雞翼
脂肪:16克

Desirable Blood Cholesterol Levels for Diabetes

	Desirable level
Total cholesterol	< 5.2 mmol/L
Triglycerides	<1.69 mmol/L
HDL-cholesterol ('Good')	>1.55 mmol/L
LDL-cholesterol ('BAD')	< 2.0 mmol/L
Total cholesterol/ HDL-cholesterol Ratio	< 5.0

Reference: NCEP ATPIII (2013) U.S.A.

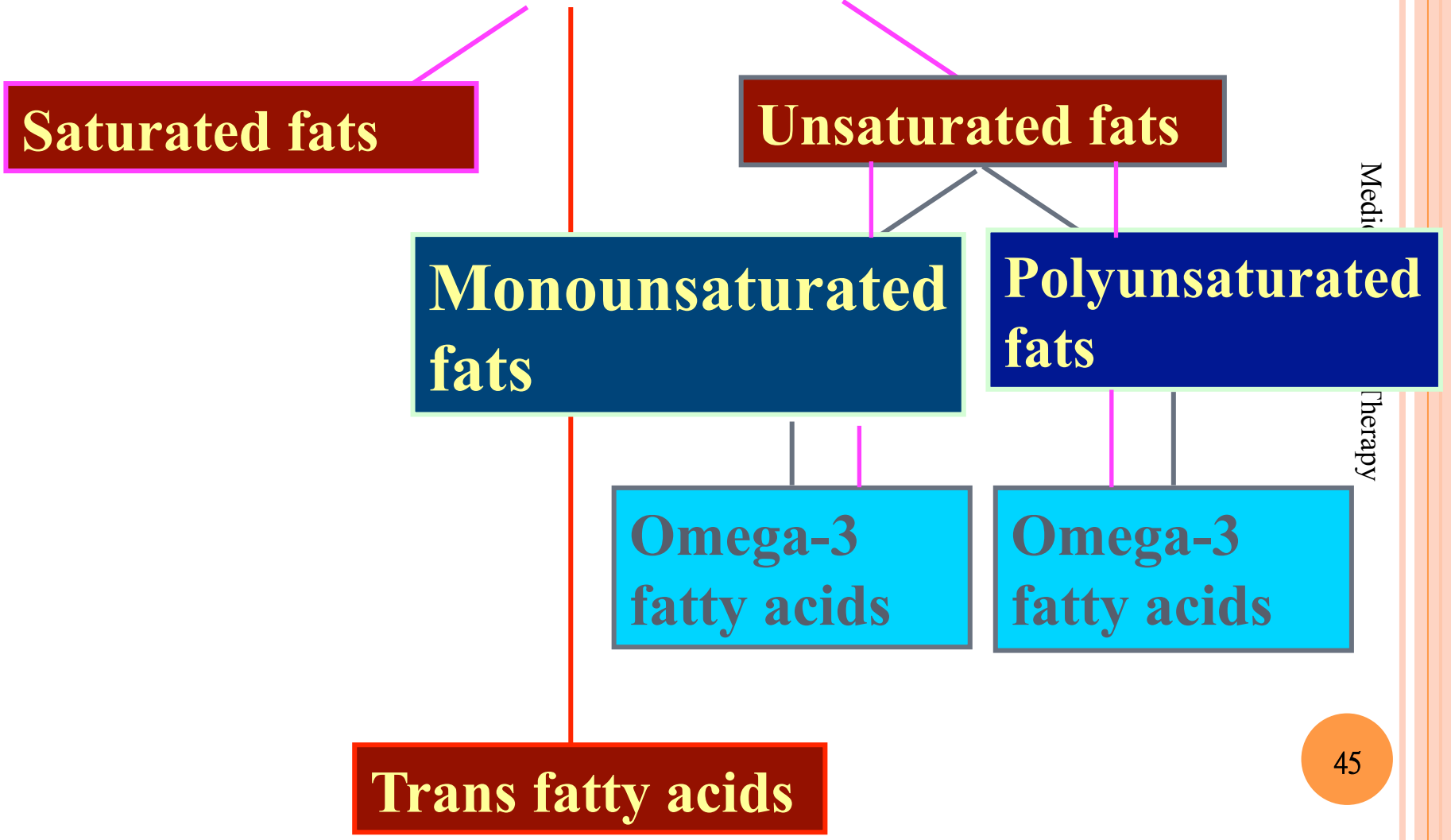
Dietary Advice

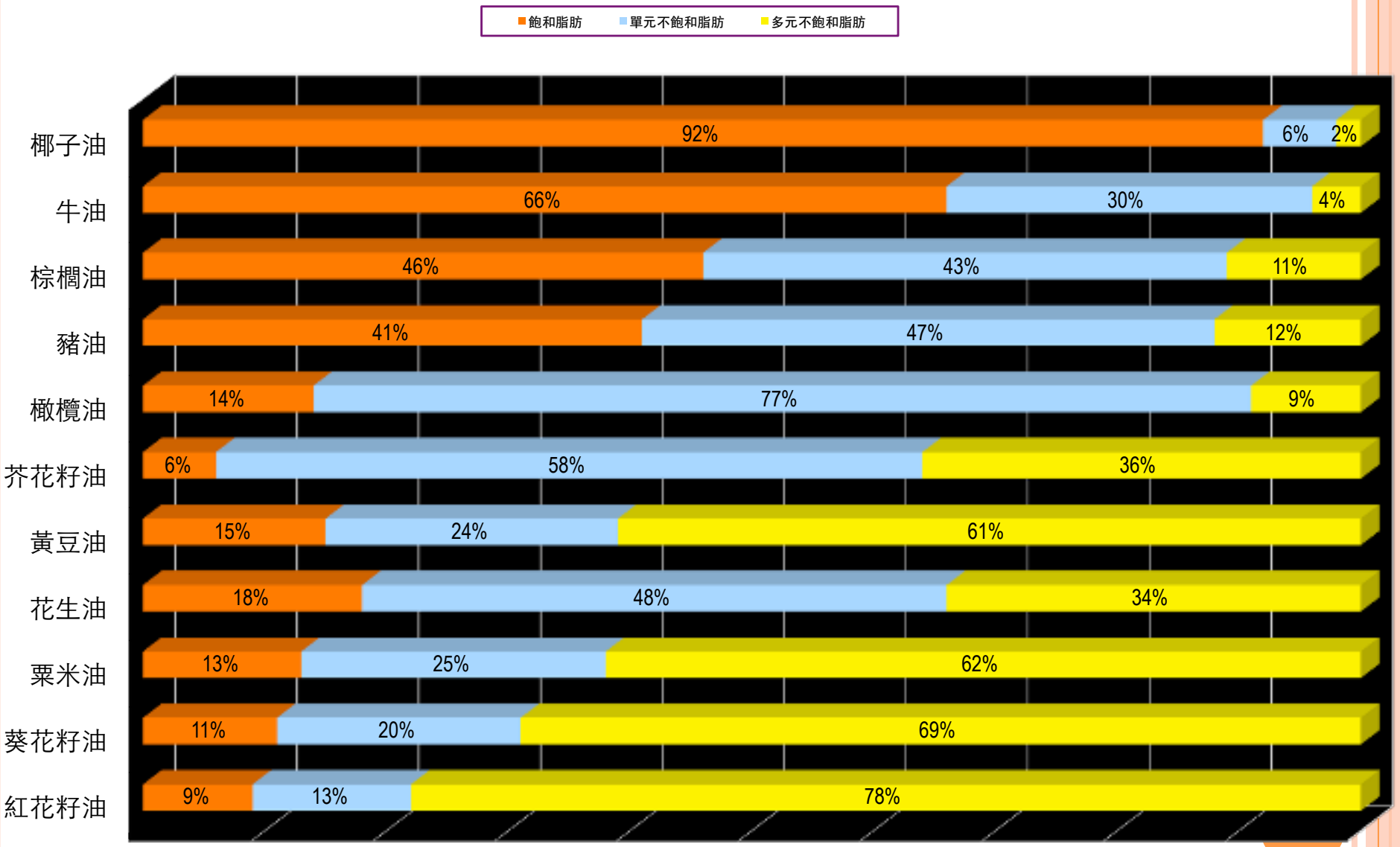
- Eat less fat, especially saturated fatty acids and trans fatty acid
- Limit high cholesterol foods
- Eat more high fiber foods, for examples vegetables, fruits, oatmeal, wholegrain products, soybean products and dried beans.
- Avoid excessive sugar intake
- Avoid excessive alcohol intake

Dietary Advice

- Increase fish intakes (especially oily fish) twice weekly, approximately 6 ounces per week
- Maintain regular exercise
- Achieve and maintain desirable body weight
- Follow the Healthy Food Pyramid to achieve a balanced eating habit

TYPE OF FATTY ACIDS




飽和脂肪
單元不飽和脂肪
多元不飽和脂肪
椰子油
牛油
棕櫚油
豬油
橄欖油
芥花籽油
黃豆油
花生油
粟米油
葵花籽油
紅花籽油
92%
6%
2%
66%
30%
4%
46%
43%
11%
41%
47%
12%
14%
77%
9%
6%
58%
36%
15%
24%
61%
18%
48%
34%
13%
25%
62%
11%
20%
69%
9%
13%
78%

SATURATED FATS

- Increase LDL-cholesterol level
- Meat products, full cream milk and many processed foods that are made with lard, palm and coconut oil

POLYUNSATURATED FATS

- Lower LDL-cholesterol level
- Corn, sunflower, soybean oils, grapeseed oil

MONOUNSATURATED FATS

- Lower LDL-cholesterol
- Replacing saturated fats can further increase HDL-cholesterol
- Camillia, Olive, canola and peanut oils, almond, hazelnuts and avocado

TRANS FATS

- Hydrogenated fatty acids that increase LDL-cholesterol and reduce the HDL-cholesterol
- Deep-fried foods, hard margarine and cakes.

WHAT IS TRANS FAT?

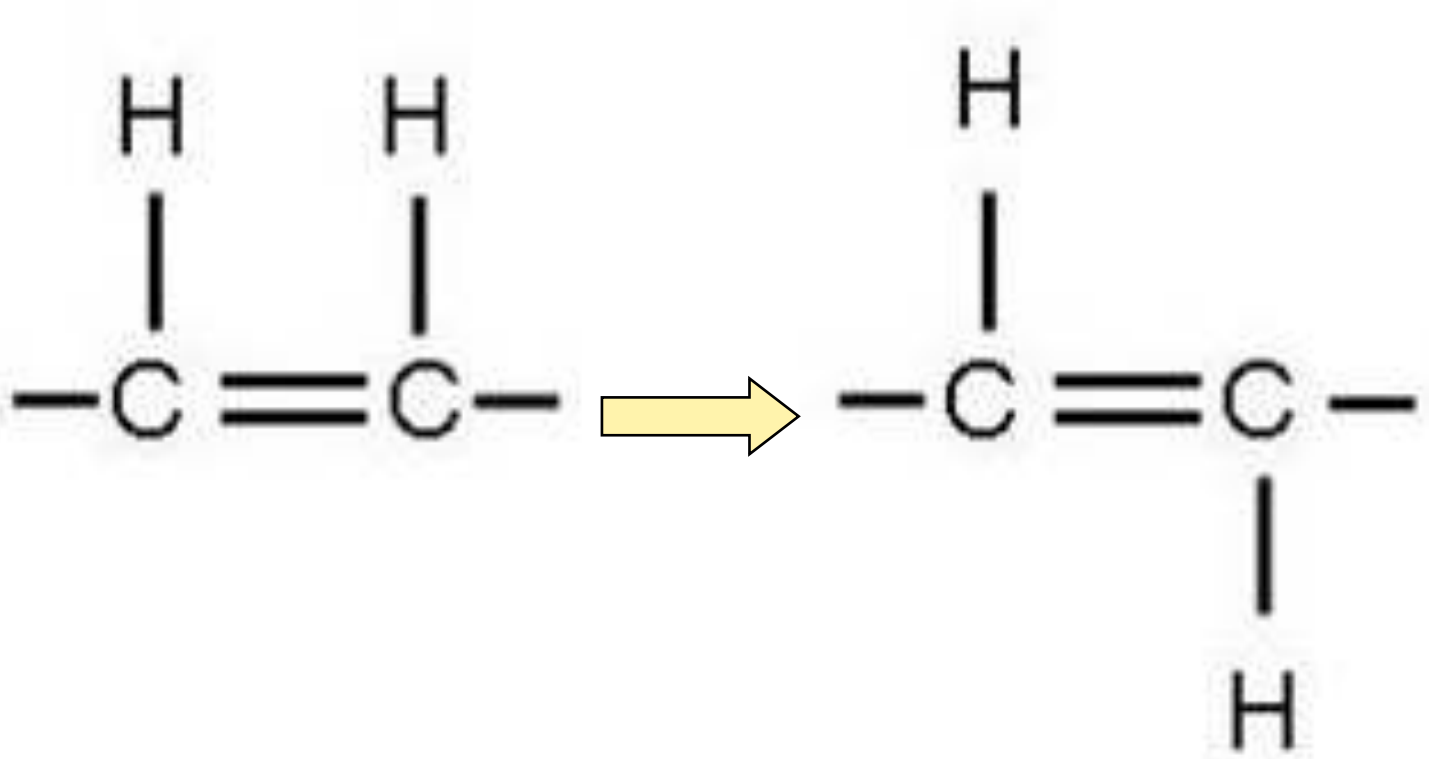
UNSATURATED FAT

氫化過程HYDROGENATION

TRANS FAT

↑LDL↓HDL ☹

反式脂肪 TRANS FAT



Unsaturated Fat

不飽和脂肪

Trans fat

反式脂肪

TRANS FAT

WHO:

Less than 2g trans fat per day

- Increase LDL and reduce HDL



食物反式脂肪含量(每1件)

炸甜圈		3.31克
曲奇 每3件		1.5克
葡撻		0.82克

酥皮		0.51克
雞批		0.48克
蛋撻		0.30克

食物反式脂肪含量(每1件)

牛油蛋糕	1.6克
雪芳蛋糕 	0.15克
腸仔飽	0.13克
菠蘿飽 	0.11克
提子包	0.05克

NAMES OF TRANS FAT

- Hydrogenated vegetable oil 氫化植物油
- Partially hydrogenated vegetable oil 部份氫化植物油
- Hydrogenated vegetable oil氫化菜油
- Hardened vegetable oil 固體菜油
- Vegetable shortening 植物起酥油
- Shortening 酥油
- Hydrogenated fat氫化脂肪
- Vegetable margarine 植物人浩黃油
- Vegetable fat 植物脂肪
- Hardened fat 硬化脂肪

CHOLESTEROL

- Increases the blood cholesterol level
- fatty meats, animal organs, squid and octopus etc.

低升糖指數飲食

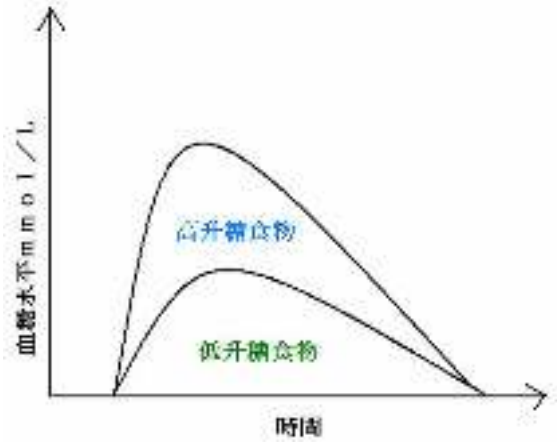
Low Glycemic Index Diet

What is GLYCEMIC INDEX (GI)?

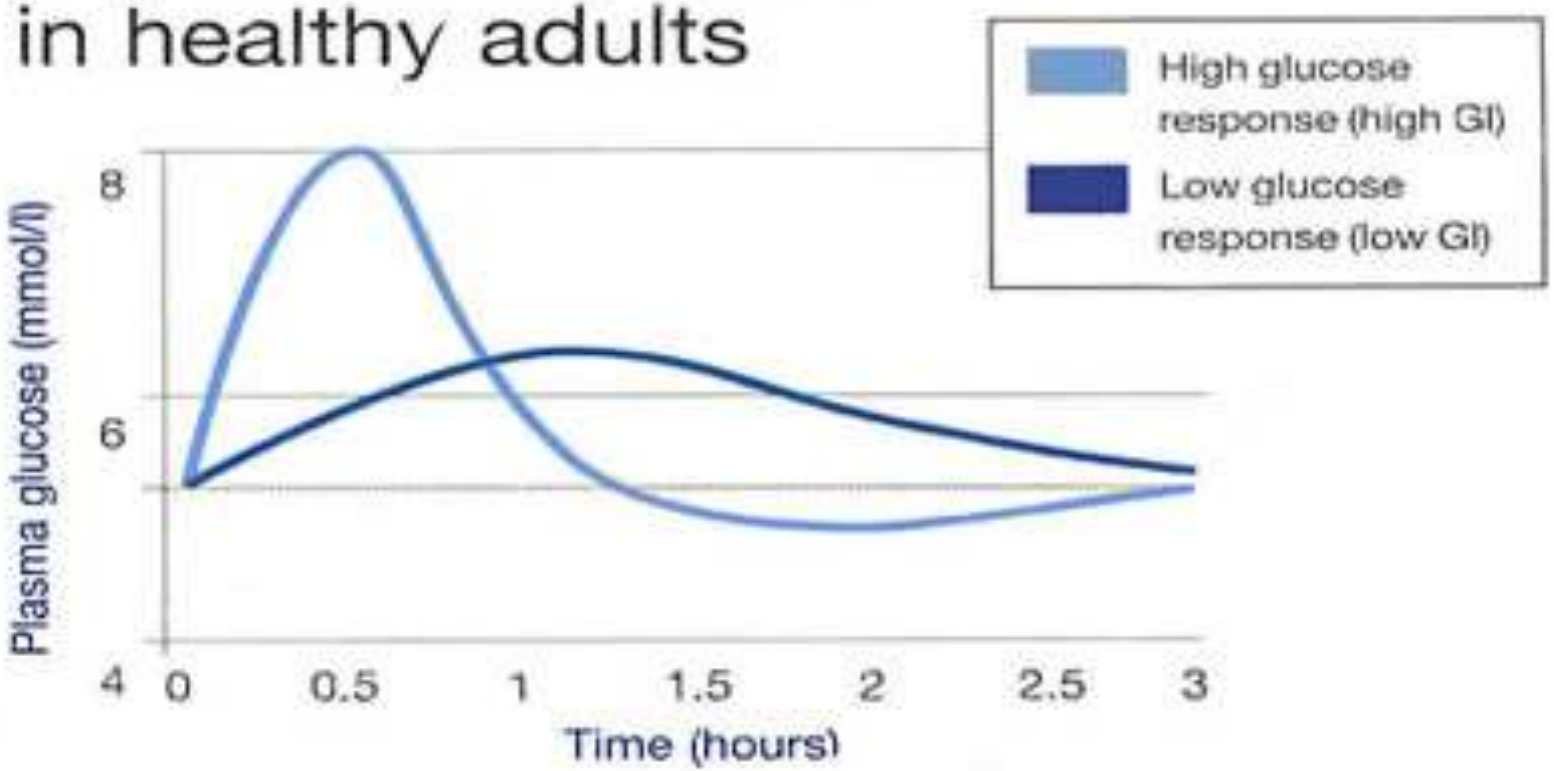
- GI is a measure of the effects of carbohydrates (CHO) on blood sugar levels
- GI is defined as the area under the 2-hr blood glucose response curve (AUC) following the ingestion of a fixed portion of CHO (usually 50g)

$$GI = \frac{\text{AUC of test foods}}{\text{AUC of standard}} \times 100$$

(either glucose or white bread)



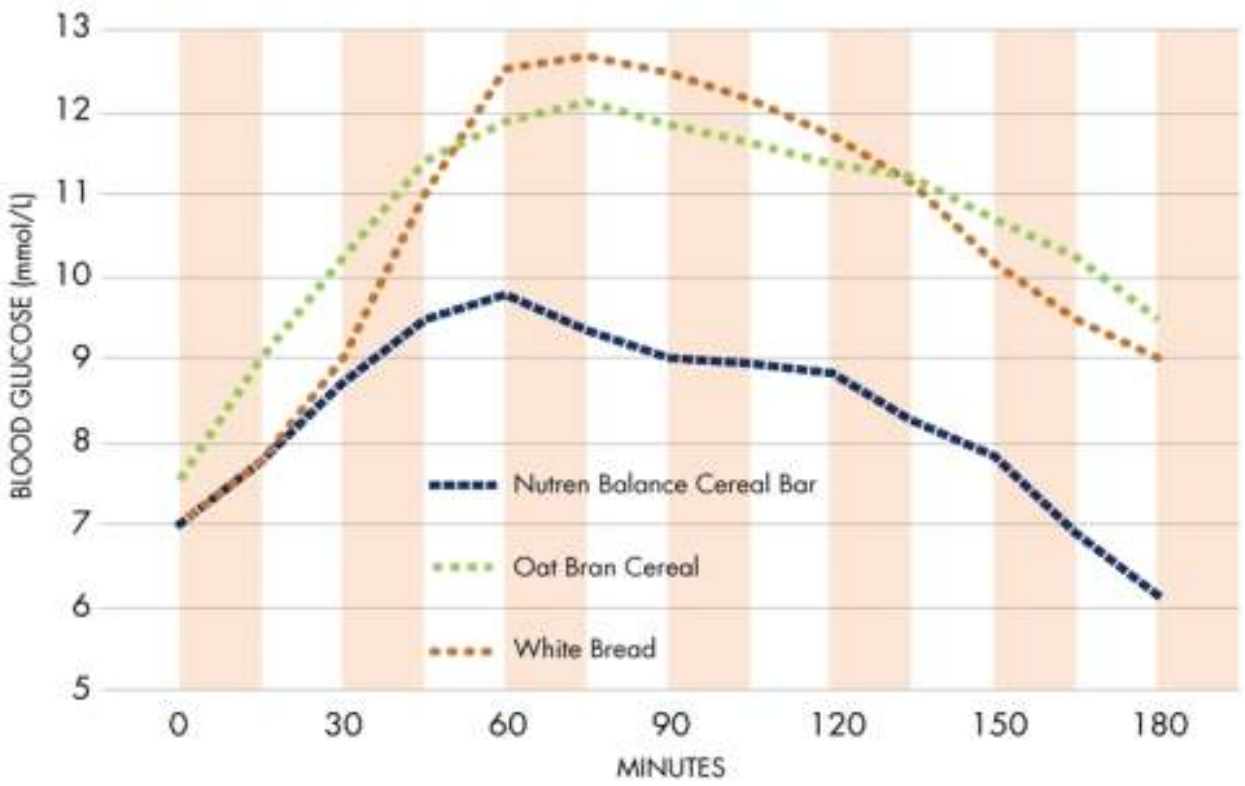
Glycemic response in healthy adults



Plasma glucose response (mmol/l) from a high versus a low GI food. The change in blood glucose concentration over time is expressed and calculated as the area under the curve (AUC) (Wolever et al., 1991).

GLYCEMIC INDEX (GI)

$$\frac{\text{BG response of 50 grams of "test food"}}{\text{BG response of 50 grams of Glucose}} \times 100\ \%$$



Low
< 55

Intermediate
55-70

High
>70

Medical Nutrition Therapy

Factors affecting the glycemic index of foods

- Factors are:
  - Type of starch
  - Cooking time
  - Food processing
  - Sugar content
  - Fat content
  - Protein content
  - Fibre content
  - pH of foods
  - Maturity of foods

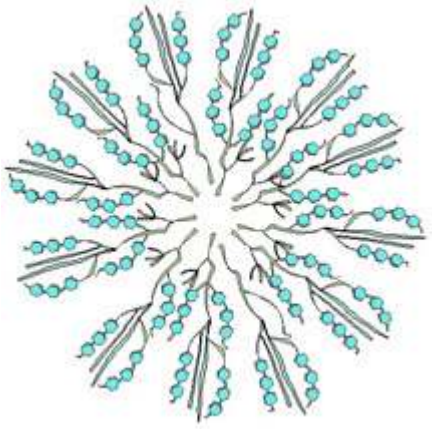


Type of starch

- Amylose (直鏈澱粉)
  - Glucose chain from 200 to 20000 units
  - Spiral structure
  - Difficult to digest
  - Low GI



- Amylopectin(支鏈澱粉)
  - Glucose chain from 1000 to 300000
  - Tree like structure
  - Easily digest (more surface area)
  - High GI



Cooking Time

- The longer the cooking time, the higher the GI
- The more water the food is absorbed while cooking, the more starch is released at the same time

Pasta cooked for 5 min → GI 34
Pasta cooked for 15 min → GI 40



White rice cooked for 1 min → GI 46
White rice cooked for 6 min → GI 87



Food Processing

- The more food processing is done, the higher the GI

Corn flakes	Instant Oats	Roll oats
GI = 86	GI = 83	GI = 42-50







Food Processing

- The more food processing on the grain, the higher the GI of bread

Pumpernickle

GI = 46



White bread

GI = 73



Sugar content

- Different sugar differer



果糖 fructose 19

蔗糖 sucrose 68



葡萄糖 glucose 100

麥芽糖 maltose 105



Fat content

- The higher the fat content, the lower the GI
- Fat slows down digestion
- Fat is absolutely not healthy!!!

white rice白飯
GI = 89



Fried Rice 楊州炒飯
GI = 80



Protein content

- Protein content of food slow down gastric emptying and digestion, thus lower GI

Milk	Macaroni
GI = 11-46	GI = 56





Fibre content

- **The higher the dietary fibre the low the GI**

Soluble fibre

- Slow down digestion and absorption of sugar

- Lower GI
- Baked beans (150g) GI = 40



Insoluble fibre

- Insoluble fibre acts as shielding effect against enzymatic degradation

- Lower GI
- Corn (150g) GI = 52



pH of foods

- The lower the pH (more acidic), the lower the GI
  - Low pH slows down digestion

Orange (120g)
pH = 4.6
GI = 31-51



Watermelon (120g)
pH = 5.2 - 5.6
GI = 72-80



Maturity of foods

- **The maturer the fruit,** the higher the GI

Green banana (1)

GI = 30



Riped banana (1)

GI = 52



GLYCEMIC LOAD (GL) 昇糖負荷

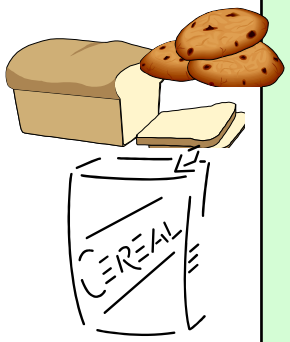
- Glycemic load (GL) is a ranking system for carbohydrate content in food portions based on their glycemic index (GI)
- GL is to predict blood glucose values of different types and amounts of food

$$GL = GI \times \frac{\text{the amount of available carbohydrate (g) in a 100g serving}}{100}$$

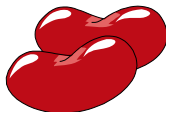
GL > 20 High; GL 11-19 Medium; GL < 10 Low

- For example instant oatmeal GI = 83; 100g contains 22g CHO

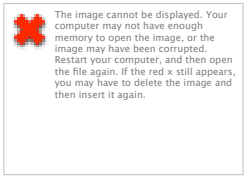
$$GL = 18 = 83 \times \frac{22}{100}$$

食物	低升糖指數 (≤ 55)	中升糖指數 (56 – 69)	高升糖指數 (≥ 70)
飯粉麵 	韓式薯粉絲 17 粉絲 26 意粉/通粉 45 杯麵 49 星州炒米 54 糙米/紫菜壽司 55	米粉 58 蕎麥麵 59 上海拉麵 61 烏冬 62	糯米 86-88 白米飯 72-83
麵包 餅乾 	吞拿魚包 46	比得包 56 漢堡包 61 消化餅 59 黑麥麵包 58 克力架餅 65 **快熟麥片/白米+糙米** 65 即食奶皇包 67 菠蘿包 65 牛角包 68 全麥麵包 69	白麵包75 英式鬆餅 77 吒呢拿威化餅 76 斑戟 80 厚片 多士 91 法包 93

Source: (1) 中大體育運動科學系研究.
(2) Foster-Powell K, Holt SHA, Brand-Miller JC. International table of glycemic index and glycemic load values AM J Clin Nutr. 2002; 76:5-76
(3) 中國食物成份表
(4) www.glycemicindex.com
(5) www.hkjda.org Hong Kong Juvenile Diabetes Association Newsletter ISSUE. 7

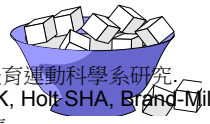
食物	低升糖指數 (≤ 55)	中升糖指數 (56 – 69)	高升糖指數 (≥ 70)
高澱粉 蔬菜 	芋頭 48 紅蘿蔔 淮山 51 粟米52-55	蕃薯 54 煲熟白薯 (連皮) 58 焗白薯(連皮) 62 煲熟新薯(連皮) 66 紅菜頭 64	薯蓉 73 炸薯條 107 焓南瓜 75
早餐 穀類	全麥維 All bran 44 瑞士營養麥 Alpen Muesli 55 燕麥糠 / 麩 50	大燕麥片早餐 69 Special K 62	維多麥 75 粟米片 74-79 可可脆米早餐 77 即食燕麥片 69-83
豆 	黃豆/腰豆/扁豆 40 綠豆/青豆/雞心豆 40 馬豆/眉豆/罐頭豆 40 豆腐 42		

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(2) Foster-Powell K, Holt SHA, Brand-Miller JC. International table of glycemic index and glycemic load values AM J Clin Nutr. 2002; 76:5-76
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食物	低升糖指數 (≤ 55)	中升糖指數 (56 – 59)	高升糖指數 (≥ 70)
鮮果 	杏 34 梨 33 李子 28 布秣 24-53 青香蕉 31 橙 31-51 芒果 51 西柚 25 蘋果 34-39 熟香蕉 52 士多啤梨/桃 40 車厘子 22 奇異果 47	木瓜56 提子 59 菠蘿66 皺皮瓜/哈蜜瓜67	西瓜76
乾果	蘋果乾 29 杏脯乾 31	葡萄乾 64 無花果乾 61	

Source: (1) 中大體育運動科學系研究.
(2) Foster-Powell K, Holt SHA, Brand-Miller JC. International table of glycemic index and glycemic load values AM J Clin Nutr. 2002; 76:5-76
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食物	低升糖指數 (≤ 55)	中升糖指數 (56 – 59)	高升糖指數 (≥ 70)
奶類食物 和代用品 	低脂奶 46 豆奶 44 高鈣豆奶 39 乳酪 37-49 大豆乳酪 50		煉奶 82
飲料	無糖罐裝蕃茄汁 31 西梅汁 43 無糖蘋果汁 44 無糖橙汁 / 西柚汁 50	小紅莓汁59 可樂 58	佳得樂 78
糖水/甜品 	**蒟蒻** 24 龜苓膏 47 綠豆沙 54	月餅56 湯圓 61	**麻糬** 85 **雪糕** 87



Source: (1) 中大體育運動科學系研究.
(2) Foster-Powell K, Holt SHA, Brand-Miller JC. International table of glycemic index and glycemic load values AM J Clin Nutr. 2002; 76:5-76
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食物	低升糖指數 (≤ 55)	中升糖指數 (56 – 59)	高升糖指數 (≥ 70)
零食 糖果 	花生朱古力 (M&M) 23 朱古力奶 27-37 朱古力 34-49 花生 13 爆谷 55 果麥條 46-50	薯片 60	米餅 82 啫喱豆 Jelly beans 80
糖 糖醇	木糖醇 (Xylitol) 7 果糖 23 乳糖 46	蔗糖 65	麥芽糖 105 葡萄糖 100 蜂蜜 103
點心 	蛋撻 45 春卷 50 叉燒酥 55	馬拉糕 61 即食奶皇包 67 糭 69 叉燒包 69	



Source: (1) 中大體育運動科學系研究;
(2) Foster-Powell K, Holt SHA, Brand-Miller JC. International table of glycemic index and glycemic load values AM J Clin Nutr. 2002; 76:5-76
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ALTERNATIVE SWEETENERS 代糖

Is alternative sweetener safe?

- No scientific evidence (on human trials) showing alternative sweetener is carcinogenic
- Only saccharin (E954) caused bladder cancer in rats study in 1972
- American Dietetic Association claimed that Aspartame, sucralose, Acesulfame-K and saccharin are all safe
- Steviol glycoside may cause cancer therefore it was banned in the past. Recent years, FDA lifted the ban

NO 1. SUCRALOSE 三氯半乳蔗糖（E955）

- Calorie: 0
- Sweetness: 600-fold of cane sugar
- Limit: <5mg per kg body weight
- Brand: Splenda
- Characteristics: heat endurance, can cook in different cooking methods



NO 2. ACESULFAME-K 醋磺內酯鉀（E950）

- Calorie: 0
- Sweetness: 200-fold of cane sugar
- Limit: <15mg per kg body weight or <1000mg/d
- Brand: Sweet One, Coca cola Zero, Extra gum
- Characteristics: heat not reducing the sweetness, can cook in different cooking methods; a little bitterness, use with other sweeteners in food





No 3. Steviol Glycoside 甜菊醇糖苷 (E960)

- Calorie: 0
- Sweetness: 250 to 300-fold of cane sugar
- Limit: <4mg per kg body weight
- Brand: Taikoo Stevia, Equal Stevia, Karori
- Characteristics: heat not damaging the structure, can cook in different cooking methods







No 4. Aspartame 阿斯巴甜(E951)

- Calorie: 4kcal per gram
- Sweetness: 160 to 220-fold of cane sugar
- Limit: <40mg per kg body weight
- Brand: Equal, Slim up and Palsweet
- Characteristics: heat and acid labile. After cooked, sweetness will be reduced



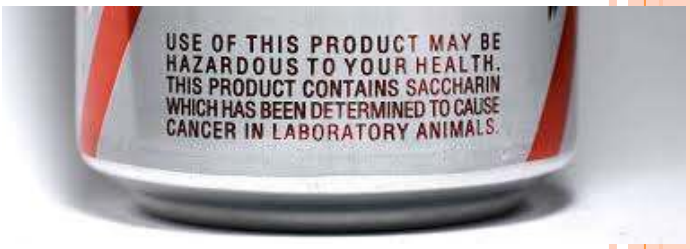


NO 5. CYCLAMATE 西克林美(E952)

- May cause bladder cancer in rats in 1969 Thus USA banned it. JECFA and European countries allowed to use including Hong Kong. USA still banned it.
- Calorie: 0
- Sweetness:30 to 40-fold of cane sugar
- Limit: <11mg per kg body weight
- Brand: Sugar Twin, Sucaryl
- Characteristics: Use in any cooking methods. Commonly used in Light beverages.



NO 6. SACCHARIN 糖精(E954)

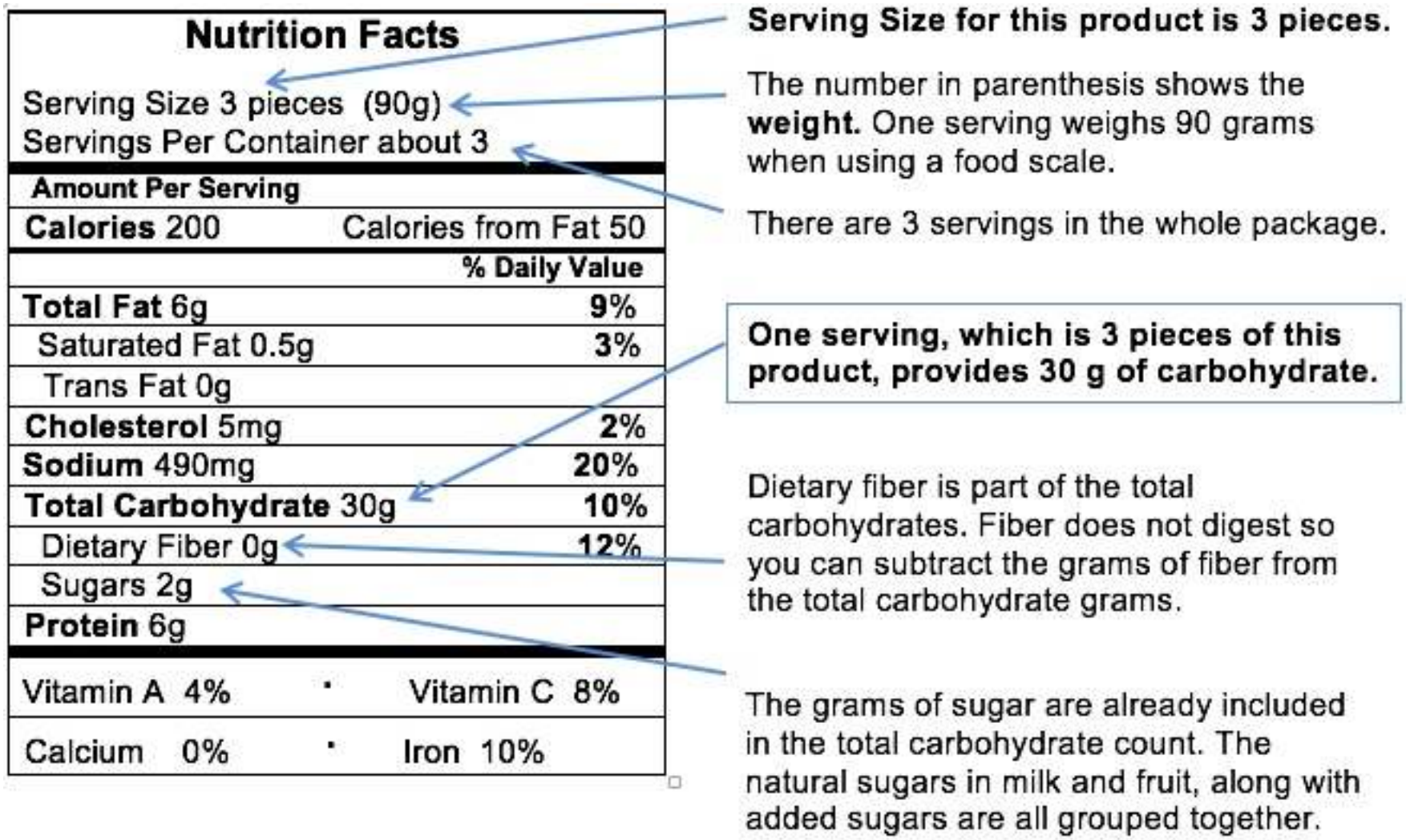


- May cause bladder cancer in rats in 1972. FDA set the rule that all products must write a claim.
- Calorie: 0
- Sweetness:200 to 700-fold of cane sugar
- Limit: <15mg per kg body weight
- Brand: Sweet'N Low, Hermesetas Original, Sweetex
- Characteristics: Heat endurance, can use in any cooking methods.



Food label

1. Calculate total carbohydrate per serving size



Nutrition Facts	
Serving Size 3 pieces (90g)	
Servings Per Container about 3	
Amount Per Serving	
Calories 200	Calories from Fat 50
	% Daily Value
Total Fat 6g	**9%**
Saturated Fat 0.5g	**3%**
Trans Fat 0g	
Cholesterol 5mg	**2%**
Sodium 490mg	**20%**
Total Carbohydrate 30g	**10%**
Dietary Fiber 0g	**12%**
Sugars 2g	
Protein 6g	
Vitamin A 4% •	Vitamin C 8%
Calcium 0% •	Iron 10%

Serving Size for this product is 3 pieces.

The number in parenthesis shows the **weight.** One serving weighs 90 grams when using a food scale.

There are 3 servings in the whole package.

One serving, which is 3 pieces of this product, provides 30 g of carbohydrate.

Dietary fiber is part of the total carbohydrates. Fiber does not digest so you can subtract the grams of fiber from the total carbohydrate grams.

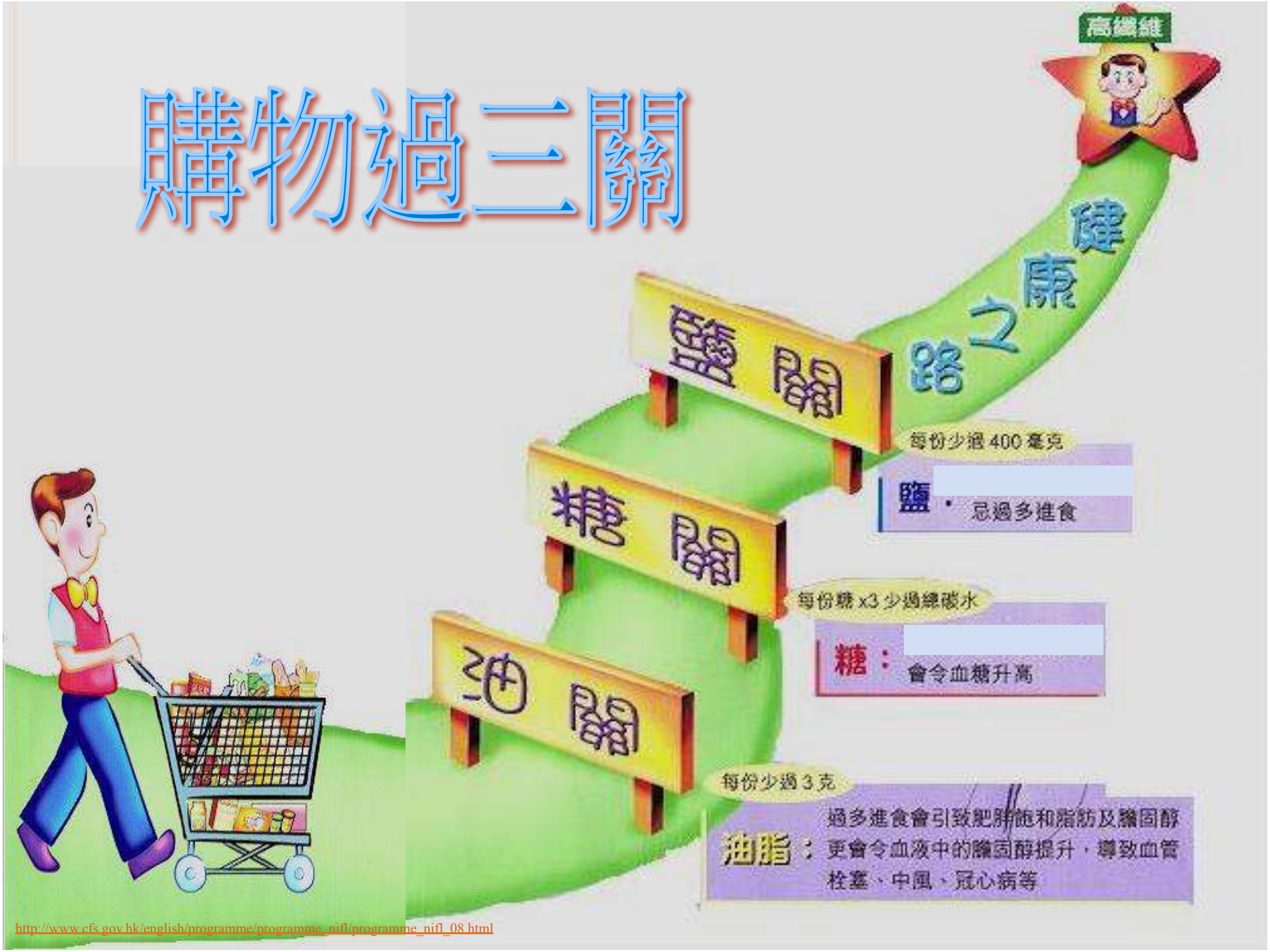
The grams of sugar are already included in the total carbohydrate count. The natural sugars in milk and fruit, along with added sugars are all grouped together.

FOOD LABEL

2. Understand nutrition claims:

- Sugar-free = <0.5g sugar per 100g or 100ml of food or fluid
- Less-sugar = <5g sugar per 100g or 100ml of food or fluid
- Light = 25% less of regular product
- No added sugar = not adding sugar during process, the food still contains fructose

購物過三關



http://www.cfs.gov.hk/english/programme/programme_nifl/programme_nifl_08.html


不再慌糖
長和醫院
內分泌及糖尿病中心醫護團隊 著
認識前期糖尿病的重要性
預防糖尿病的飲食良方
保持身心健康、提高生活質素
CP1897.COM