

疾病營養學Therapeutic Nutrition

肥胖及飲食治療

Nutrition intervention and obesity

保健營養學系

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Energy requirement of the body:

- 基礎代謝率(Basal metabolic rate, BMR)
- 食物生熱效應(thermogenic effect of food, TEF)
- 身體活動量

每日總熱量需要=基礎代謝率 + 食物生熱效應 + 身體活動量




基礎代謝率BMR：

休息狀態下維持生命所需（包括呼吸、循環、體溫、肌肉張力及各器官功能）之基本能量

影響BMR之因素

1. 表面積：瘦高型較高
2. 年齡：成長快速期高 老年人低
3. 性別：男生 > 女生
4. 氣候：熱帶民族較低
5. 營養：營養不良時較低
6. 疾病：體溫升高 1°C BMR上升12-13%
7. 激素：甲狀腺素, 生長激素使BMR上升



●食物生熱效應

食物攝取後經消化、吸收、代謝、排出所需要消耗之熱量

蛋白質 > 脂肪 > 醣類


身體得到的淨熱量：醣類 > 脂肪 > 蛋白質



Obesity 肥胖: excessive accumulation of body fat or adipose tissue

Overweight 過重: excessive heaviness, which may or may not include an abnormal amount of adipose tissue (muscle accumulation or fluid retention)





進食及體重之調節：

短期調節： **satiety center** (飽食中樞) and **feeding center** (進食中樞) in **hypothalamus** (下視丘)

Glucostatic theory 葡萄糖恆定理論： **food intake is regulated by glucose utilization of the cell**

長期調節

Lipostatic theory 脂質恆定理論: body weight is regulated by the fat store in the adipose tissue

肥胖發生之可能原因

- Heredity:

Ob gene in adipocytes: produces leptin
(瘦體素)

Gene that regulate BMR and fat
oxidation in human



- Set point theory: 設定點理論

每個人都有生理上理想的體重設定點



● Defect in regulating TEF : 食物熱能效
應之調節受損

TEF is lower after overeating in obese
people



短期進食調節的功能受損


External theory 外在環境理論: obese people are more likely to response to external environment stimulation rather than internal signal of hunger sensation

想吃 ≠ 飢餓

身體在體重減輕時之反應

● Plateau effect 平原效應：體重停滯期

1. 體重減輕 \Rightarrow 瘦體組織減少 \Rightarrow BMR \downarrow 身體對熱量的需求減少
2. 食物攝取減少 $\downarrow \Rightarrow$ TEF $\downarrow \Rightarrow$ 熱能消耗減少
3. 體重減輕 \Rightarrow 體能活動之熱能消耗減少



$BMR + TEF + activity = \text{能量需求}$
 $1200 + 300 + 500 = 2000 \text{ kcal}$
能量攝取 1500 kcal (-500 kcal)
2 wks 減輕 1 kg

$800 + 150 + 250 = 1200 \text{ kcal}$
能量攝取 1500 kcal ($+300 \text{ kcal}$)
體重增加



Diets usually used in weight reduction

1. Starvation or fasting: 飢餓療法
< 200 kcal/ day

2. Very low kcal diet (VLCD): 極低熱量飲食
200-800 kcal/day



VLCD好處：

- a. Effective in weight reduction (12-16 wk, 20kg)**
- b. Improve hypertension and DM condition**
- c. Improve pulmonary function**
- d. Lower plasma lipids**



VLCD併發症：

cardiac failure, cold intolerance,
fatigue, nervous, constipation,
diarrhea, dry skin, anemia, menstrual
irregularities, gout, gallstone



Candidates for a VLCD program:

1. **BMI >30**, 其他飲食均成效不彰
2. **BMI 27-30** 但有其他疾病或危險因子
3. 沒有懷孕, 哺乳及其他肝, 心, 腎臟及精神疾患等

適用期間12-16週



Ketogenic diet: 生酮飲食 high protein, high fat, low CHO diet

- a. Lower intake because of satiety sensation of high fat consumption
- b. Ketone body excreted in urine
- c. Water loss
- d. High TEF because of high protein intake



吃肉減肥法

熱量攝取減少

水分排除增加

食物熱能效應增加

但增加肝,腎負擔,會產生酮體不適用於孕婦,青少年,糖尿病等

4. 高糖低脂飲食: CHO 70-80%, fat 10-20% of total kcal

5. 其他偏方飲食:

Tea

Milk

Vegetable and fruit


Vinegar

Commercialized weight reducing formula



6. 限制熱量均衡飲食: nutritionally adequate

- 醣類 55% of kcal
- 蛋白質 15-25%, at least 1-1.3g/kg BW
- 維生素礦物質: may be needed
- 纖維素: promote satiety, reduce kcal density, decrease absorption efficiency
- 水: facilitate the elimination of harmful metabolites



正確的減重飲食原則

低熱量均衡飲食

每天勿低於1000 kcal

可以代餐取代一餐

多攝取纖維質

多喝水

增加每餐進食的時間

勿於睡前進食