

熱量的概念
The Concept of Energy



Needs 5000 kcal/d to maintain his body weight

Dad needs	2200 kcal/d
Mom needs	1700 kcal/d
Son needs	1100 kcal/d
Total for family	5000 kcal/d

If mom and dad exercise rarely, they would gain weight on their diets of 1700 kcal and 2200 kcal respectively.

The above information is provided by the Sport Nutrition Unit of the Athlete and Scientific Services Division. All information is for reference only.

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Whether you are an elite athlete or just someone who enjoys sports, proper nutrition should not be overlooked. Having a good appetite doesn't guarantee your diet is nutritionally adequate. Both quantity and quality of the food you eat should be considered when it comes to eating well. Therefore, eating whatever is available is definitely not a good meal plan.

Food provides the energy you need in daily activities. For this reason, what you eat and how much you eat must meet the specific needs of your event and training. For example, a marathon runner needs to replenish with food and fluid throughout the race; whereas a sprinter would not need to take any kind of supplementation during an event which takes less than a minute.

Eating properly gives you the fuel you need during training and competition. It is also an important component to winning.

Talent, hardwork combined with the expert guidance from your coaches and the right diet pave the road to victory.



What is Energy?

When food breaks down in your body, energy is released. Energy is the fuel for your daily activities. The unit of measurement for energy is kilocalorie (kcal), more commonly known as calorie (cal), but kilocalorie is the term used by most professionals.

Energy content of the six nutrients

- | | |
|---|-----------------|
| 1. Carbohydrate | 4 kcal/g |
| 2. Protein | 4 kcal/g |
| 3. Fat | 9 kcal/g |
| 4. Vitamin (eg. Vitamin A, B, C etc) | no energy value |
| 5. Mineral (eg. Calcium, Iron, Sodium, Potassium etc) | no energy value |
| 6. Water | no energy value |

Energy content of the two non-nutrients

- | | |
|------------------|-----------------|
| 1. Dietary Fibre | no energy value |
| 2. Alcohol | 7 kcal/g |

As you can see, fat has the highest energy density, more than twice of what's in carbohydrate.

Energy content in some foods

- | | |
|---|----------|
| 1 teaspoon sugar (pure carbohydrate) | 16 kcal |
| 1 boiled egg white | 16 kcal |
| (almost pure protein with trace amount of carbohydrate) | |
| 1 teaspoon corn oil (pure fat) | 45 kcal |
| 1 bowl of cooked rice | 234 kcal |
| 3 tael of lean meat | 215 kcal |
| 1 orange | 50 kcal |
| 1 cup skim milk | 90 kcal |

Energy Needs

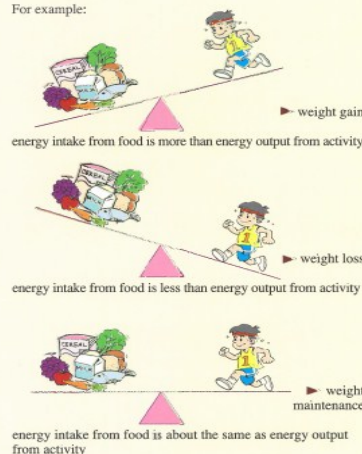
To estimate your energy needs, the following factors need to be considered.

- Basal Metabolic Rate: The amount of energy needed to sustain necessary bodily functions (eg. pumping of the heart, breathing, blood circulation etc) when at rest. In simple terms, if your basal metabolic rate is 1200 kcal and you have slept the whole day without doing other activities, you would have burnt 1200 kcal on that day.

- Age: Your energy needs vary with age, for example:
 - growing children and adolescents need more energy than adults.
 - elderly needs less than adults.
- Sex: Males need more than females of the same age.
- Health Condition: If you are sick, pregnant or lactating, your needs increase.
- Activity Level: Energy needs increase with increase activity level.

If your energy intake and output is not the same, you will experience weight change.

For example:



序

無論你是精英運動員或者只是運動愛好者，對飲食營養都不能掉以輕心。食量的多寡並不是一個良好飲食的指標，食物的份量及質素同樣重要，不可以抱著草草吃飽便了事的態度。

食物是人體活動的能量來源，故運動員所吃食物的質和量應符合運動項目的需求。例如：一個長跑運動員要在比賽中以食物及飲品來補充體力及水份；相反，一個短跑選手就不必在數十秒的賽事中作任何補充。

飲食得宜不但能使你在訓練及比賽時體力充沛，更是獲取最佳成績的重要一環。

天資優厚而且力求上進的你加上教練的悉心栽培，教導及正確的飲食方式，必定能盡顯才華，屢創佳績。



什麼是熱量？

食物在身體被分解時會產生熱量，這些熱量是人體活動的燃料來源。量度熱量的單位是千卡(kilocalorie)與你們熟悉的卡路里(calorie)相通，但是千卡才是一般專業人士應用的單位。

六種營養素所含的熱量

- | | |
|------------------|--------|
| 1. 碳水化合物 | 每克含4千卡 |
| 2. 蛋白質 | 每克含4千卡 |
| 3. 脂肪 | 每克含9千卡 |
| 4. 維生素 | 不含熱量 |
| (例如：維生素A, B, C等) | |
| 5. 礦物質 | 不含熱量 |
| (例如：鈣、鐵、鈉、鉀等) | |
| 6. 水 | 不含熱量 |

兩種非營養素所含的熱量

- | | |
|--------|--------|
| 1. 纖維素 | 不含熱量 |
| 2. 酒精 | 每克含7千卡 |

可見脂肪的熱量密度是最高，比碳水化合物的熱度高出一倍有多。

食物的熱量

- | | |
|------------------|-------|
| 1 茶匙砂糖(純碳水化合物) | 16千卡 |
| 1 隻鹼蛋白(差不多是純蛋白質) | 16千卡 |
| 1 茶匙粟米油(純脂肪) | 45千卡 |
| 1 碗白飯 | 234千卡 |
| 3 兩瘦肉 | 215千卡 |
| 1 個橙 | 50千卡 |
| 1 杯脫脂奶 | 90千卡 |

熱量的需要

熱量的需要視乎以下幾項因素：

- 基本代謝率：是指一個人在靜態的情況下，進行維持生命必須的活動(例如：心跳、呼吸、血液循環等)所需的熱量。
簡單來說，若你的基本代謝率是1200千卡，而你整天都在睡覺，沒有任何其它活動的話，這天便會消耗1200千卡。
- 年齡：不同年齡有不同的需要，例如：
 - 成長中的兒童及青少年比成年人的需要多；
 - 老人家的需要較一般成年人低。
- 性別：男性的熱量需要比同年齡的女性多。
- 身體狀況：患病、懷孕及哺乳時的需要比一般人多。
- 活動量：運動量愈大就需要愈多熱量。

若你的熱量攝取與消耗不一樣便會導致體重產生變化。

例如：
a)



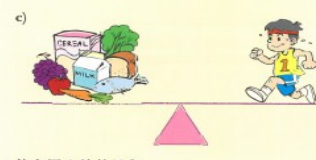
吃得少活動量少
▶ 體重增加

b)



吃得少活動量大
▶ 體重減輕

c)



飲食攝取的熱量與消耗的大致相同
▶ 維持體重

某些運動員每天也要接受很長時間的訓練，所需的熱量十分多。

舉一個例子：

一個男性划艇運動員差不多每天都要接受近六小時的訓練。
一家三口：爸爸、媽媽與三歲兒子



一天從飲食攝取5000千卡才足夠維持體重	爸爸一天攝取 2200千卡
	媽媽 1700千卡
	三歲兒子 1100千卡
	共 5000千卡

媽媽與爸爸若活動量少，就算是分別攝取1700與2200千卡也會導致體重增加。

以上資料由運動員及科研事務科轄下的運動營養部提供，只供參考。歡迎轉載以上資料，惟事先須得本院許可；轉載時亦須鳴謝本院。

如有查詢，請致電2681 6277與運動科學部聯絡。

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