The Assignment for Friday, The Sixth Friday

We eat food to fuel our bodies for energy, growth and repair. Carbohydrates, proteins and fats are broken down by the digestive system into their simplest components: simple sugars, amino acids and fatty acids.

Carbohydrates are the body's preferred fuel, although proteins and fats can also be converted into energy. Food energy is measured in kilojoules (kJ). The common term for this used to be 'Calorie', but 'kilojoule' is the term now accepted internationally. This unit of measurement allows us to talk about how much energy a food contains and how much energy is burned up during exercise.

Energy value

A kilojoule is a unit of measure of energy, in the same way that kilometers measure distance. Food energy can also be measured in terms of the nutritional or 'large' Calorie. One Calorie (Cal) has the same energy value as 4.186 kilojoules (kJ). This should not be confused with the 'small' or gram calorie, which is used by scientists to measure the amount of energy required to heat water. There are 1,000 (small) calories in one (large) Calorie, which is why it is also sometimes known as a 'kilocalorie'. The terms 'calorie' and 'Calorie' are often used interchangeably, which can be confusing.

4.184 kilojoules = 4,184 joules = 1 Calorie = 1 kilocalorie = 1,000 calories

Kilojoules in food

The foods we eat provide energy, which is measured in kilojoules. Just how much energy depends on the amount of carbohydrate, protein and fat the food contains. Fats and alcohol are by far the most energy-dense foods. This is why they should only be consumed in moderation.

The energy value per gram of various food components includes:

Fat – 37kJ (9 Cal) – not all fatty acids may provide the same amount of energy
Alcohol – 29kJ (7 Cal)
Carbohydrates – 16kJ (4 Cal) – not all carbohydrates may provide the same amount of energy
Protein – 17kJ (4 Cal)
Dietary fibre – 13kJ (3 Cal) – if fermented by bacteria in the large intestine
Water – 0kJ (0 Cal).

Sugars and carbohydrates

Carbohydrates are broken down by the body into sugars or 'glucose'. Some carbohydrate foods are metabolized faster than others; these are known as foods with a high glycaemic index (GI). Some research suggests that a diet dominated by carbohydrate foods with a high glycaemic index is associated with greater body fatness.

Our energy requirements are variable

Energy requirements differ from one person to the next because of genetic predisposition, build, gender, age, metabolism, environment and amount of regular physical activity. An individual's energy requirements can also differ from one day to the next and as we grow older. For example:

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Young children and adolescents require high amounts of energy to fuel their growth and development.

Women need more energy during certain stages of their reproductive lives, such as pregnancy and breastfeeding. It is thought that daily energy needs increase on average by about 1,800kJ for pregnant women and around 2,500kJ during breastfeeding.

Muscle tissue has a big appetite for kilojoules. The more muscle mass you have, the more kilojoules you will burn.

Men generally have higher energy requirements than women because they have more muscle tissue.

As we age activity levels are often reduced, which causes a loss of muscle tissue, and so our energy requirements tend to decrease. Various other age-related changes to the metabolism also contribute to the reduced energy requirements. It's not clear how much of the muscle lost during ageing is a result of the ageing process or due to reduced activity. Strength and resistance training in older adults (even the very old and frail) seems to help reduce or prevent the decline in muscle mass generally observed with ageing.

Too many kilojoules

When we regularly eat more energy than our body needs, the excess is stored inside fat cells. Just 1kg of body fat contains the equivalent of 37,000kJ. To lose 1kg of body fat in a week, you would need to burn an additional 37,000kJ, or around 5,000kJ a day.

How to lose excess weight (or gain weight)

The best way to lose excess weight is to switch to a high fiber, low fat diet and, most importantly, to exercise regularly. Exercise not only uses up stored energy but also helps to stimulate muscle development. Remember, the more muscle tissue you have, the more kilojoules you can burn.

Big Mac 7.5 oz (214 g) 540
Quarter Pounder with Cheese 7 oz (198 g) 510
Double Quarter Pounder with Cheese 9.8 oz (279 g) 740
Hamburger 3.5 oz (100 g) 250
Cheeseburger 4 oz (114 g) 300
Double Cheeseburger 5.8 oz (165 g) 440
Filet-O-Fish® 5 oz (142 g) 380
Small French Fries 2.5 oz (71 g) 230
Large French Fries 5.4 oz (154 g) 500
Coca-Cola Classic (Small) 16 fl oz cup 150
Coca-Cola Classic (Large)32 fl oz cup 310

(Note: I've picked on McDonalds here but you can easily find the caloric value of other fast food restaurants on the Internet…. And foods that you eat at home as well.)

*Taken from http://www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/kilojoules_and_calories-explained and http://nutrition.mcdonalds.com/getnutrition/nutritionfacts.pdf