

Nutrition 101

the basics of fueling your body



“You are what you eat” is a phrase that carries much kudos in these current times, where many of society’s most prevalent health issues are related to over indulgence! Add to that the abundance of nutrition information available through the media, and we are left to work out fact from fiction for ourselves. One of the keys to understanding nutrition is knowledge of the basic science of food and the human digestive system - information that is unfortunately less often presented. Hence, we have decided to go back to basics to try and de-mystify the science of what we eat and the fundamentals of how our body processes food.

The key energy constituents of food are the “macronutrients” we know as protein, carbohydrate and fat. Dietary fibre is also considered a macronutrient but provides only a small amount of energy. Food also provides micronutrients (vitamins and minerals) which are vital for normal body functions but do not provide energy.

Kilojoules (kJ) and calories (Cal) are energy units of food where 1Cal is equal to 4.18kJ. The energy content of 1 gram of each macronutrient is: Fat 37kJ, Protein 17kJ, Carbohydrate 17kJ and Dietary Fibre 8kJ. Alcohol also contains energy

providing 29kJ per gram but unlike the other macronutrients, it is not an essential part of the human diet and provides no vitamins or minerals. Most foods we eat provide us with a combination of the macronutrients. Below are some examples that depict rich sources of carbohydrate, protein and fat along with a mixed energy beverage. Each image provides a similar amount of energy (1000-1500kJ) - can you identify the major energy source/s (for answers refer page 2).



a) 2 tablespoons (40g) butter contains energy from :



b) Large tin Tuna (425g) in spring water contains energy from:



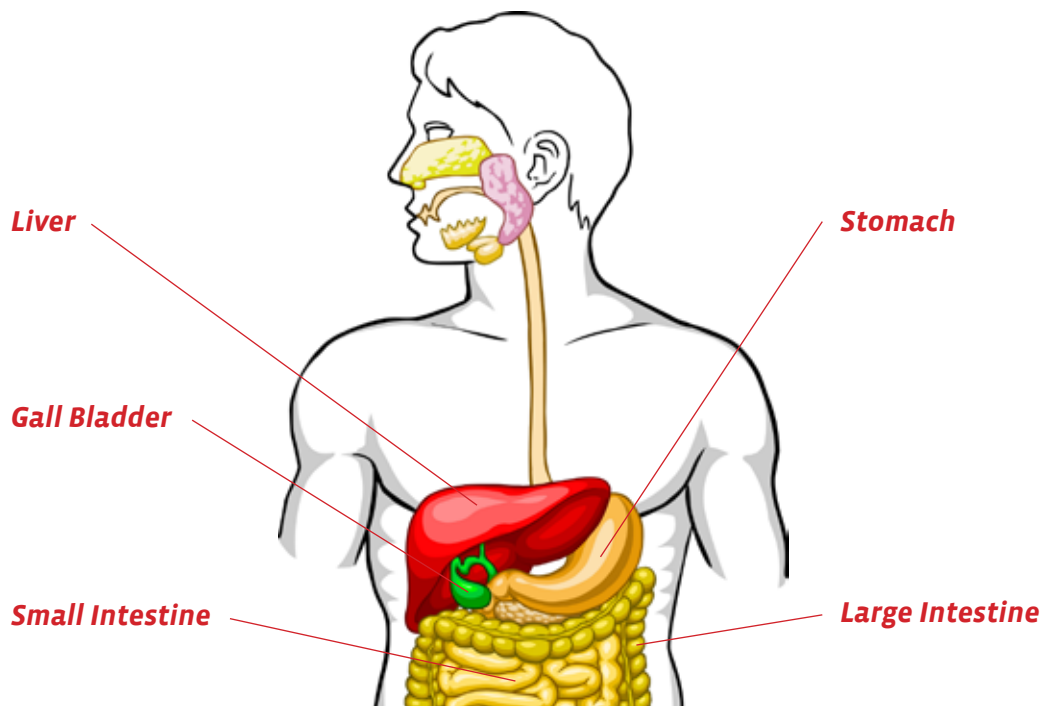
c) 25 Jelly Beans (75g) contains energy from:



d) 3 glasses whisky & cola contains energy from:

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The Human Digestive System is complex so we'll provide a very basic overview of what happens when we eat & drink. The body uses mechanical force along with enzymes & chemicals to break food down into its simplest components for digestion. This activity starts in the mouth with teeth & saliva and continues along the entire digestive tract.



The stomach is essentially a mixing vat where digestive acids attack food. Alcohol can enter the bloodstream via the stomach whilst the macronutrients are not absorbed until they reach the intestines occurring at different rates depending on form, chemical composition and structure. Carbohydrate in its simplest state such as the glucose in jelly beans is the first nutrient to be absorbed in the small intestines enabling rapid energy utilisation. Carbohydrate molecules with more complex structures such as wholegrain cereals are more slowly broken down and absorbed providing sustained energy release. Protein consists of long amino acid chains that are dismantled prior to absorption in the small intestine. Fat molecules need to be broken up into fatty acid constituents and digested with the assistance of bile (sourced from the gall bladder) which also occurs in the small intestine. Protein and fat are generally more slowly absorbed when compared to carbohydrate. Upon entry into the

bloodstream nutrients are transported to the liver where their metabolic role is determined according to such things as: form and storage capacity (e.g. alcohol cannot be stored and must be oxidised); existing energy stores along with the current rate of energy expenditure. Dietary fibre is largely indigestible and passes through the small intestine into the colon (large intestine) where good bacteria can utilise as an energy source.

The nutrient and energy needs of sports people often vary throughout the training week, across the season and off-season along with the day before, during and after competition. Therefore it is helpful for Sports Trainers assisting active individuals to perform at their peak to have an understanding of the energy content of macronutrients and how these are preferentially digested by the body.

COMING UP IN THE NEXT EDITION **We'll look at Carbohydrate in more detail.....**

For more information on sports nutrition visit Sports Dietitians Australia: www.sportsdietitians.com.au