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**Sports Nutrition**

**Nutrition & Digestion**

In this assessment I am going to examine the factors of sports nutrition, it plays an important part in sports performance. It can make the difference between playing amateur or professional sport. Understanding and knowing what to eat can maximise the bodies potential. As a sports performer it is essential to have thorough working knowledge of nutrition and digestion. This will allow you to understand the effects diet can have on your performance. The first thing I'm going to discuss is definitions of the following terms.

The meaning of nutrition is the means by which the energy and nutrients in food are taken in and used by your body. So sports nutrition is using the knowledge of nutritional strategies on sports performance. A balanced diet is a diet consisting of the proper quantities and proportions of the food needed to maintain health or growth. The definition of calorie is the energy needed to increase the temperature of one gram of water by 1°C. A kilocalorie or food calorie or 1,000 calories. Kilojoules is the measure of energy, for example in food and physical activity 1 kilo joule (Kj) = 0.238 Kcal. Recommended daily allowance (RDA) is the amount of nutrients and calories an individual is meant to consume daily. The accepted level of nutrients that an average person requires, the basis for the Recommended Daily Allowance is established by the U.S. government.

To be healthy you must maintain a balanced diet, there are six components of a balanced diet. The first component I am going to talk about is Carbohydrates, which is a macronutrient along with proteins and fat. Macronutrients are required by our body in daily amounts greater than a few grams. Carbohydrates can be broken down into

two main categories; simple and complex. Fizzy drinks, sweet and even fruits contain simple sugars while whole grains (bread), fruits and cereals contain complex carbohydrates. The main differences between the two groups are their chemical structures. Simple sugars are made up of single or double sugar units while complex carbohydrates are made up of numerous units of sugar and are called polysaccharides. In our body, the end product of both is glucose which is transferred into energy. Carbohydrate, in the form of glucose, is the preferred fuel for working muscles. It is particularly important during high intensity activity but whatever exercise is performed some carbohydrate will be used. Glucose is stored in the muscles and liver as a substance known as glycogen and is rapidly converted back to glucose when it is required. The capacity for glycogen storage is limited at 70kg, an individual has glycogen reserves of approximately 400g. Once these stores have been used, the ability to perform exercise is reduced. In order to maximise the body's glycogen stores, athletes should habitually consume a high carbohydrate diet, contributing approximately 60% to 70% of total energy, equivalent to 6g to 10g carbohydrate/kg body weight/day. This is about 5-15% greater than the level of carbohydrate recommended for the general population.

Protein is another important component to a balanced diet, the two types of protein are complete and incomplete. Complete proteins contain all 8 essential amino acids, if they don't then they are considered incomplete proteins. Things like eggs, meat, and milk are complete proteins and incomplete proteins are mainly from plant sources like cereals, bread, rice, pasta, and nuts. Our bodies cannot store excess protein (unlike carbs and fat). It is used all over the body. Proteins are the primary component of numerous body tissues, this nutrient also makes up the outer layers of hair, nails, and skin. They are the main component of muscle tissue. Proteins are made up of carbon, hydrogen, oxygen, and nitrogen. Our protein intake should be around

15% and each gram of protein contains 4 calories. All proteins are built up with amino acids, there 20 amino acids. 12 are non-essential and 8 are essential to sustain optimal growth and functioning.

Fat is the final macronutrient that I am going to discuss, there are two type of fat that people refer to. One type of fat is body fat is the fat on your body, if you eat more calories than you need you are likely to have too much body fat. The other type of fat is dietary fat which is the fat you eat, fats are our store houses of energy. When we have excess nutrients in our body, some of it is stored as fat. The primary purpose of fat is energy production. There are two main types of fat. Saturated (solid) which is animal fats (meat, butter, and lard) are usually saturated fats and contribute to heart disease and cancer. Unsaturated (liquid) is the other type of fat which is vegetable fats (olive oil and corn oil). Liquid fats are generally unsaturated and are less harmful to the body. Fat is a less important provider of energy for exercise than carbohydrate and, unlike glycogen, its availability is never a limiting factor for performance. Even the leanest competitors have a supply of fat. Moreover, a high fat intake makes it difficult to achieve a diet with sufficient carbohydrate for an athlete's needs. An intake of less than 30% of food energy from fat is generally recommended for sports people.

Two more nutrients are vitamins and minerals, which are micronutrients. Minerals make up only 4 % of our body weight, but they are important for a healthy body. Some necessary minerals are calcium, iron, phosphorus, iodine, potassium, and chlorine. Some sources of potassium include bananas, brown rice, and garlic. Potassium is important in the transmission of nerve impulses, heart rhythm, and muscle function. Calcium is found in milk, dried apricots, and sardines. Calcium is essential for strong bones and teeth, it also plays an active role in the body's immune system. A lack of calcium in

the diet is a contributing factor to osteoporosis, a condition that causes brittle bones in adults. Our bodies need 13 vitamins, they are Vitamin A, Vitamin C, Vitamin D, Vitamin E, Vitamin K, Thiamine (B1), Riboflavin (B2), Niacin (B3), Vitamin B6, Vitamin B12, Folic acid, Pantothenic acid, and Biotin. If you eat a healthy diet you will get all of these. Intensive and regular exercise may slightly increase the requirements for a number of vitamins and minerals. However, the increased needs can generally be met, provided the sports person is consuming a varied diet and is meeting their energy requirements. There is no evidence that vitamin and mineral supplements improve performance in well-nourished athletes. Indeed, some vitamins can be toxic if taken in large amounts. Generally, toxic levels of vitamins are achieved through high supplement intake and not from dietary sources. Some people think if they take a lot of vitamins they will become healthier, but this is not the case. The medical names of different conditions are based on the name of the vitamin, for example Hypervitaminosis A. Amongst many others good sources of vitamin A include, eggs, liver, and trout. More sources of vitamins include avocados and salmon, for vitamin E. Vitamin E is important in cell maintenance and also plays an active role in the maintenance of a healthy heart, blood and circulation. It is one of the body's main antioxidants. The body makes vitamin K in the large intestine, but it is also found in small amounts in meat, most vegetables, and wholegrain cereals. Vitamin K is involved in the blood clotting process and in the maintenance of strong bones.

The last Nutrient I'm going to discuss is water, our bodies contain more water than anything else. Women are made up of about 60% water and men are made up of about 70%. Water is without a doubt the most important nutrient, each cell in your body needs it. We would die a lot sooner from lack of water, than from a lack of food. Our bodies need 6 – 8 glasses of water (2/3 litres) of water a day.



The digestive system is made up of the digestive tract, a series of hollow organs joined in a long twisting tube from the mouth to the anus and other organs that help the body break down and absorb food. Organs that make up the digestive tract are the mouth, oesophagus, stomach, small intestine, large intestine also called the colon rectum, and anus. Inside these hollow organs is a lining called the mucosa. In the mouth,

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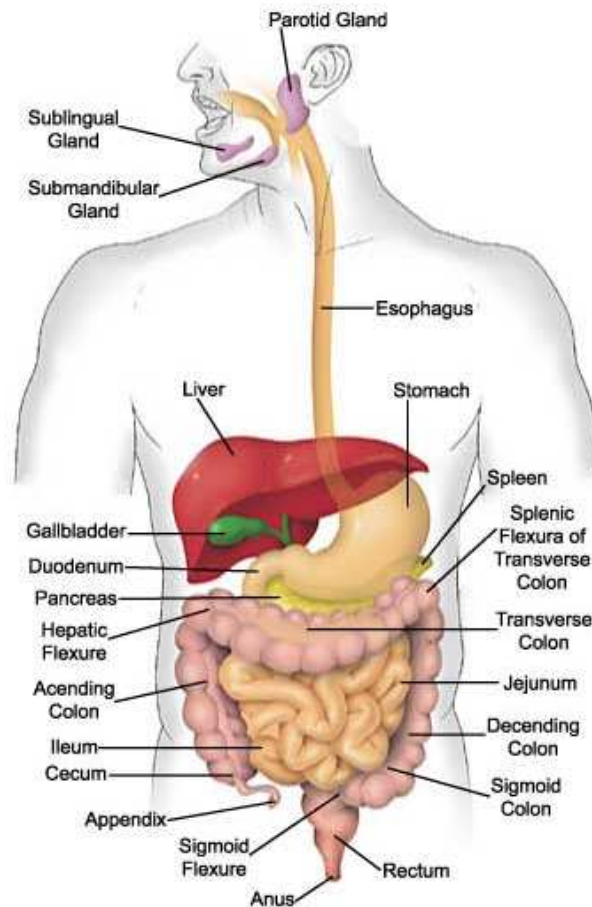
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tract. Two "solid" digestive organs, the liver and the pancreas, produce digestive juices that reach the intestine through small tubes called ducts. The gallbladder stores the liver's digestive juices until they are needed in the intestine. Parts of the nervous and circulatory systems also play major roles in the digestive system.

When we eat foods such as bread, meat, and vegetables they are not in a form that the body can use as nourishment. Food and drink must be changed into smaller molecules of nutrients before they can be absorbed into the blood and carried to cells throughout the body. Digestion is the process by which food and drink are broken down into their smallest parts so the body can use them to build and nourish cells and to provide energy. The digestive process begins in the mouth. Food is partly broken down by the process of chewing and by the chemical action of salivary enzymes. The Oesophagus is a long tube that runs from the mouth to the stomach. It uses rhythmic, wave-like muscles movements to force food from the throat into the stomach. This muscle movement gives us the ability to eat or drink even when we're upside down. The stomach is a large, sack like organ that churns the food and bathes it in a very strong acid (gastric acid). After being in the stomach, food enters the duodenum, the first part of the small

intestine. It then enters the jejunum and then the ileum (final part of the small intestine). In the small intestine, bile (produced in the liver and stored in the gall bladder) pancreatic enzymes (produced in the Pancreas), and other digestive enzymes produced by the inner wall of the small intestine help in the breakdown of food. After passing through the small intestine, food passes into the large intestine. In the large intestine some of the water and electrolytes are removed from the food. Many microbes in the large intestine help in the digestion process. The first part of the large intestine is called the Cecum. Food then travels upward in the ascending colon, and then through the sigmoid colon. Solid waste is finally stored in the rectum until it is excreted via the Anus. (The process above represents the digestive system).