

DIET AND NUTRITION

It is an important component of good health and sporting activities. Nutrition can help enhance athletic performance. An active lifestyle and exercise routine, along with eating well, is the best way to stay healthy.

Optimum nutrition may help maximize athletic performance by;

1. Maximising energy store.
2. Achieving ideal weight for performance.
3. Ensuring sufficient intake of vitamins and minerals.
4. Maintain adequate hydration.
5. Optimising pre competition and competition food.

Requirements of Athletes:

MACRONUTRIENT:

Macronutrients are nutrients that provide calories or energy to the body. The purpose of macronutrients is to promote healthy cellular growth, metabolism, and to maintain normal bodily functions. The macronutrients, as suggested by the name “macro,” are needed in the body in large amounts to provide the full and proper effect. There are three types of macronutrients: carbohydrates, proteins, and fats.

CARBOHYDRATE:

Carbohydrates are needed to provide energy during exercise. Carbohydrates are stored mostly in the muscles and liver in the form of glycogen.

Complex carbohydrates are found in foods such as pasta, whole grain breads, and rice. They provide energy, fiber, vitamins, and minerals. These foods are low in fat.

Simple carbohydrate such as sugars found in soft drinks, jams and jellies, and candy provide a lot of calories, but they do not provide vitamins, minerals, and other nutrients.

The average amount of energy available from stored carbohydrates is only 8.4 kilojoules i.e. 2000 kcal which will provide fuel for a run of approximately 40km.

Endurance training increases the capacity of the muscles to store glycogen. Untrained individuals have muscle glycogen store of 80-90 mmol/kg where as trained individual may have glycogen store as high as 130-135 mmole/kg.

PROTEIN:

A major role of protein for athlete is to repair and build muscle tissues. Protein can also be used by the body for energy, but only after carbohydrate stores have been used up. Just like carbohydrates, proteins provide the body with 4 calories per gram. Proteins are most commonly found in animal products, nuts, and beans.

The recommended daily intake of protein for a sedentary person is 0.8 gm/kg/day. The protein requirement of an athlete adult is considerably higher than those for sedentary individuals i.e. approximately 1.2-1.7 gm/kg/day.

FAT:

Fats are collectively referred as triglycerides. A triglyceride composed of glycerol and three fatty acids. Fats provide essential elements of cell membranes and also provide the body with the ability to absorb fat-soluble vitamins A, D, and E.

They also provide the highest calorie count, providing the body with 9 calories per gram instead of the 4 provided by one gram of either carbohydrate or protein.

Approximately 98% of dietary lipid exists as triglycerides while 90% of total body fat resides in adipose tissues. Fat provides body's largest store of potential energy.

The energy store capacity of fat is more than twice equivalent quantity of carbohydrates and proteins.

For high intensity short duration exercise i.e. 1-2 min almost all energy supplied from glycogen stored in the skeletal muscle.

Carbohydrate is the only nutrient that provides energy when the muscles have insufficient oxygen for their needs. This type of exercise is called anaerobic exercise and produces lactic acid.

MICRONUTRIENTS:

Micronutrients are chemical elements consist of thirteen organic essential vitamins and seven inorganic minerals. Micronutrients play an important role in energy production, haemoglobin synthesis, healthy growth, bone and immune health, and maintain normal metabolism. As the name “micro” suggests, these chemical elements are only required to exist in small amounts to provide ample effects.

The thirteen essential vitamins fall into one of two categories, water-soluble and fat-soluble. The water-soluble vitamins, the eight vitamins which consist the vitamin B complex and vitamin C, must be consumed daily as the body is unable to store. In contrast, the fat-soluble vitamins, vitamin K, A, D and E, can be stored in the body’s adipose tissue and therefore does not have to be consumed on daily basis to maintain the correct levels in the body.

Minerals are inorganic nutrients that also play a key role in ensuring an athlete’s health. The seven minerals needed to maintain accurate energy and hydration levels include:

1. Calcium - Body needs calcium to build and maintain strong bones. Your heart, muscle s and nerves also need calcium to function properly. All athletes should get 1,200 to 1,500 mg of calcium daily from food or supplements.

2. Iron - Iron is a trace mineral that is highly significant to endurance athletes. Iron is critical to optimal athletic performance because of its role in energy metabolism, oxygen transport, and acid-base balance.

3. Zinc - For athletes, zinc is an important supplement for optimal performance that prevents early onset fatigue during workouts. The mineral does this by binding to insulin to ensure proper glycogen storage which controls the amount of insulin needing to be produced by the pancreas.

4. Magnesium - Magnesium helps the muscles to relax after your workout, which counteracts the role that calcium plays in contracting the muscles. A lack of magnesium can affect this delicate balance and you're likely to feel the effects of this as sore muscles.

5. Sodium - It is important to maintain fluid balance in the body and is also lost in the sweat at a much greater quantity than other electrolytes (such as potassium and

magnesium). It regulate muscle contraction, nerve function and blood volume. “Low sodium levels can cause dehydration, muscles cramps or even organ failure.

6. Chloride- Chloride is one of the most important electrolytes in the blood. Losing sodium and chloride can reduce power, strength, agility, skill, and concentration, all of which are essential for elite athletes.

7. Potassium - Athletes should be especially concerned with their potassium intake. It is responsible for regulating total body water and stabilizing controlled and automatic muscle contractions. It is lost through sweat and urine.

These are important because proper hydration prior, during, and after an activity is crucial in the effect on an athlete’s performance.

WATER:

-Water contribute 65-75%of the weight of the muscles & 10% of fat mass. It serves as body’s transport medium.

-Water has tremendous heat stabilizing qualities because it absorb considerable amount of heat with small changes in temperature. It maintain a stable body temperature during environmental heat and stress.

-A sedentary adult in normal environment needs about 2.5 lit of water intake per day.

-Excessive water intake under certain exercise can cause a complication called hyponatremia. Hyponatremia is a condition where sodium levels in the blood are lower than normal. In many cases, too much water in the body dilutes the sodium, causing the condition. It causes swelling of brain tissues produces headache, confusion, nausea, cramping, seizures, coma and pulmonary oedema.

To prevent over hydration and risk of hyponatremia following steps should be followed:

-Drink 400-600 ml of fluid 2-3 hrs before exercise.

-Drink 150-300 ml of fluid about 30 min before exercise.

-Do not drink more than 1000 ml of plane water in one hour.

-Add small amount of sodium to digest fluid.

-Include some glucose in the rehydration drink to facilitate intestinal water uptake via glucose sodium transport mechanism.

PRE GAME MEAL

The pre game meal or pre competition meal provide adequate energy and ensures optimal hydration to the athletes.

PURPOSE OF THE PRE-GAME MEAL:

1. To prevent low blood sugar and its symptoms of fatigue, indecisiveness, blurred vision and light-headedness.
2. If eaten far enough in advance for digestion to occur (2-4 hours) to replenish fuel (glycogen) store in the muscles.
3. To prevent hunger feelings and to settle the stomach by absorbing gastric juices.
4. To allow optimal exertion and performance without abdominal discomfort.

NUTRITION PRINCIPLES:

-Carbohydrates make the best pre-game foods. They digest quickly and are easily taken into the muscles. High protein foods (meat, eggs, etc.) take longer to digest while fatty foods (all fried foods, hamburgers, etc.) sit in the stomach for longest and may produce a feeling of heaviness.

-Be sure to have players drink plenty of water before the game to prevent dehydration, 2-3 glasses of water up to 2 hours before any game, and more just before the game if possible.

-If a player can't eat before the game, he should try to eat additional high carbohydrate foods the day before. Players can't cram good nutrition into one day and they should eat a high carbohydrate diet every day to ensure optimal replacement of muscle glycogen.

AVERAGE DIGESTION TIMES

Large meal: 3-4 hours. Smaller meal: 2-3 hours. Liquid meal: 1-2 hours.

WHEN TO EAT MEALS

Morning Game:

Players should eat a large high carbohydrate dinner and a bedtime snack the night before, if they can tolerate it. They should also eat a light snack in the morning to

prevent hunger. To settle the stomach and prevent low blood sugar levels one or two slices of toast can be effective.

Afternoon Game:

Players should eat a large high carbohydrate breakfast and a light lunch.

Evening Game:

Players should eat a large high carbohydrate breakfast and lunch then an optional light snack 1 -2 hours before the game.

SAMPLE MEALS

BREAKFAST:

1 cup orange juice

1 cup cereal

1 cup milk

1 small banana

2 slices bread

1 tsp butter

Total calories: 650

Carbohydrates: 122 gm (75%)

Fats: 11 gm (15%)

Proteins: 16 gm (10%)

LUNCH:

1 cup vegetable soup

2 oz chicken (white meat)

2 slices bread, lettuce, tomato

½ cup apple sauce

1 date

1 cup skimmed milk

Total calories: 625

Carbohydrates: 102 gm (65%)

Fats: 10 gm (15%)

Proteins: 31 gm (20%)

SNACKS:

1 cup orange juice
1 small banana
1 cup milk
2 slices raisin bread
1 tbsp apple jelly
1 tsp butter

TOTAL CALORIES: 340

Carbohydrates: 63 gm (70%)

Fats: 3 gm (8%)

Proteins: 12gm (14%)

DINNER;

1 Cup vegetable juice
1 cup lettuce and vegetable
4 tsp cottage cheese
1 bagel
1 tsp butter
2 tbsp dried raisins

TOTAL CALORIES: 360

Carbohydrates: 66 gm (78%)

Fats: 6 gm (15%)

Proteins: 14 gm (15%)

