

Sports person and proper nutrition

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It is presumed that an active player or athlete spends at least four hours per day in active practice. The physical activity depends on the type of game and sport. It is also well known, that, competitive matches required more energy.

Reference sportsman:

Reference sportsman is defined as one aged 20-39 years weighing 60 kg.in body weights and with 7-15 per cent body fat. Daily he involves himself 4 hours in moderate activity during practice. He needs 3600 Kcal of energy per day at physiological level which can be obtained by rations giving 4320 Kcal. It includes an allowance of 20 per cent for losses during processing, kitchen and plate wastage.

Reference sportswoman:

Reference woman is between 20-39 years of age and weighing 50 kg. She spends 4 hours in moderate activity during practice. She requires 2900 Kcal which

she can get from ration yielding 3480 Kcal per day. It provides for wastage/losses of 20 per cent of various levels.

Table 2: Recommended dietary intake of nutrients at ration level

	Reference sportsman	Reference sports woman
Net calories (Kcal.)	4310	3470
Protein (g)	100-120	80-100
Calcium (g)	1-2	1-2
Iron (mg)	50-75	60-100
Retinol (mg)	1000-2000	1000-2000
Thiamine (mg)	3-4	2-3
Vitamin C(mg)	100-200	100-200
Nicotinic acid (mg)	40-50	40-50

Carbohydrates can provide energy upto 50-70 per cent of the total requirement. Endurance athletes can use the upper level. Visible and non-visible fat could meet from 20 to 30 per cent of the energy needs and the lower level is suitable for endurance athletes. Proteins can supply above 10 to 15 per cent of energy and upper most limits may be 2 g per kg. body weight.

Ensure adequate glycogen stores are meeting the needs of high intensity sports. Muscle and liver glycogen stores supply the glucose vital for production of anaerobic energy. It is, therefore, necessary to replenish glycogen

Table 1: Range of the daily energy consumption in the training process of the deferent sports

Sports	K Cal./kg/day
Gymnastics	50-68
Sprint and middle distance runners	55-70
Long distance and marathon runners	60-80

Item (in g)	Veg.	Non-veg.
Rice	150	150
Wheat flour	250	250
White bread	150	150
Biscuits	20	20
Cheese or <i>Paneer</i>	50	-
Butter/Dam	20/50	20/50
Whole gram	35	35
Dhal	35	-
Milk	900	700
Banana or apple	One	One
Sweet lime or orange	200	200
Root vegetables	150	150
Green leafy vegetables	175	175
Other vegetables	200	200
Onion	100	100
<i>Ghee</i>	20	20
Veg. oil	40	40
Sugar	50	50
Mutton/chicken/fish	-	250
Eggs	-	100

stores after long or intense training period. Failure to do so results in reduced quality of training. The lower the glycogen stores the greater the tendency for the training session to become aerobic. Sometimes liquid replacements are necessary.

Ensure that muscle enzyme systems are of sufficient concentration to optimize extraction of energy from the fuel. Enzymes are necessary to enable athletes to generate energy at sufficient rates to sustain training. Enzymes are partially depleted and depleted every day of hard training. To replete it is necessary to ingest certain vitamins and minerals, pyridoxine, *i.e.* vitamin B is utilized in over 60 enzyme systems involved in metabolism of proteins, fats and carbohydrates. Magnesium is an activator of many enzymatic processes, particularly those related to aerobic metabolism. There have been reports of potassium deficiency in distance runners.

Limit fat intake :

Unfortunately many athletes often ingest too great a proportion of their kilo calories in fat, this should be

Item (g)	Veg.	Non-veg.
Rice	100	100
Wheat flour	200	200
Bread	100	100
Biscuits	20	20
Cheese or <i>Paneer</i>	30	-
Butter or jam	20/50	20/50
Whole gram	30	30
Dhal	30	-
Milk	900	700
Banana or apple	One	One
Orange or sweet lime	200	200
Root vegetables	100	100
Green leafy vegetables	150	150
Onion	50	50
<i>Ghee</i>	20	20
Vegetable oil	40	40
Sugar	40	40
Egg	-	50
Mutton/chicken/fish	-	200

There are certain contributing factors which are responsible to positive adaptation

avoided especially if fats are saturated ones.

Eat adequate fibre:

Ensure that vegetable, fruits, cereals and grain products are consumed regularly.

Eat adequate protein:

It is still popular opinion that a proper diet for athletes should be based on the animal protein foods. This is a misconception. Probably the main disadvantage of eating large amount of protein foods is that it reduces the amount of carbohydrates rich food that can be eaten. Athletes in training need to eat about four and half times in weight more carbohydrate rather than the protein. Another disadvantage is that the excess nitrogen arising from the unwanted protein requires extra urine for its excretion. This results in a water loss, to be added to that of sweat, which increases the risk of dehydration especially in summer. Animal protein foods are useful because they supply nutrients such as iron, calcium and B-vitamins as well as protein. On the other hand some of them eat cheese particularly may also contain



undesirable amounts of fat. This shows that animal derived foods are by no means the only source of protein.

It is often not adequately realized that there are appreciable amounts of protein in many vegetables and cereals. Suitable choices of food can provide ample protein intake without jeopardizing an adequate supply of carbohydrate. Protein intakes exceeding 2 g/kg/day should be avoided.

Meals low in protein and high in carbohydrates between training sessions during the day facilitate glycogen repletion and higher proteins during dinner facilitate regeneration of tissues.

Limit sugar and salt intake-sugar is an acceptable component of the athlete's diet but not in large quantities. Large quantities of sugar will compromise the proportion of vitamins and minerals needed by the athletes. Majority of carbohydrates should be non-sweet complex carbohydrates. While common salt is extremely important aspect of the sportsmen's diet. It is also true that in the interest of maintaining optimal electrolyte balance and sufficient muscle contraction over long periods persons should not consume highly salted foods. High salt diets also tend to lead, water retention, and therefore weight gain. It may result in elevated blood pressure too.

Ensure fluid replacement :

Many sportsman fail to hydrate adequately before events and games and fail to rehydrate after words. During games heavy sweating occurs at the expenses of body water content and unless it is replaced the resulting dehydration can impair physical performance. This is particularly so in endurance activities where the circulation has the full responsibility of providing fuel and oxygen to the muscles as well as sufficient blood flow through the skin for heat removal and supply of fluid to the sweat glands. When fluid losses exceed 2 per cent of body weight, significant deterioration in endurance performance has been observed. In extreme

circumstances a high degree of circulatory strain can be experienced and the body can collapse. Sweating rates as high as 2-2.5 litres per hour can occur during a prolonged intensive efforts lasting more than 2 hours such as marathon run or a high intensity team sports, *i.e.*, body weight loss between 6 to 10 per cent. Replacement of 40-50 per cent of the sweat should be encouraged. Remember sweat concentration of sodium chloride may be lower in acclimatized person. Cold fluids (5 to 10°C) empty from the stomach can be quite uncomfortable to the athletes and can restrict breathing; hence, small volumes of 150-200ml, *i.e.*, one glass drink regularly are, therefore, more suitable. Drink of higher concentration empty more slowly from the stomach than more dilute ones. While even small amount of glucose, *i.e.*, 3.5 g per 100 ml of water slow the gastric emptying rate, fructose does not have the same effect. However, low concentration of carbohydrate contributes very little to energy reserves and it would take a high fluid intake to obtain enough carbohydrate to be useful. The recent technique of combining many small glucose molecules into a large molecule termed a glucose polymer is the most ideal carbohydrate additive.

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