Nutrition and Hydration in Sports

A guide for Health and Performance

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WHAT ARE NUTRIENTS?

NUTRITION
Nutrition is a basic human need and prerequisite to a healthy life. A proper diet is essential from the very early stages of life for proper growth, development and to remain active.

NUTRIENTS
Nutrients are components of food which are required for physical growth and development, maintenance of normal body function and physical activity. There are some non-nutrient components also present in various foods which help in maintaining health like phytochemicals, probiotics etc.
Nutrition has been an integrated part of sports since long however its nature and principles have keep on changing along with growing experiences on players and researches. The most important part of sports nutrition is developing healthy eating habits from the early stages of life. It will not only help in enhancing the performance but will also maintain an athlete’s long term health.

Consuming appropriate food items before or after training/competition can help in recovery for next day’s session.

Adequate fluid intake during training and competition plays a detrimental role for the performance of athletes. Maintaining body weight for weight category sports prior to competition can be achieved through nutritional support without affecting the performance.
STEPS TOWARDS ENHANCING PERFORMANCE IN SPORTS THROUGH NUTRITION

The very first step is to make healthy and balanced food choices.

Quantity of Food
- How much
- When
- How often

Quality of Food

Supplementation
- Through proper consultation with doctor/nutritionist

Recovery & Hydration
- The right amount to meet the physical requirement during training
Fruits and vegetables should make half part of your plate in each meal.

- Whole fruit, Fruit salad
- Chapati, Rice, Corn flakes, Oats Daliya, Bajra Brown Bread etc.
- Low fat milk, Curd, Lassi of low fat milk, Vegetable raita
- Salad, Soup, Vegetables cooked in less oil/ghee
- Egg, Fish, Chicken, Mutton, Paneer, Soyabean, Legumes etc.
A sports food pyramid is a pyramid shaped illustration in which the bottom includes food groups which needs to be consumed adequately for health and performance. The unhealthy or least recommended foods are on the top of Pyramid.

- **EAT SPARINGLY**: Sweets, Salty Snack, Sweetened Drinks, Fast Food
- **EAT CAUTIOUSLY**: Oil, fats
- **EAT MODERATELY**: Milk, Dairy products, Chicken, Fish, Poultry, Egg, Dry Fruits
- **EAT LIBERALLY**: Fruits and Vegetables
- **EAT ADEQUATELY**: Whole Cereal- Aata with choker, Daliya, unpolished rice, Bajra, Jowar, Whole wheat bread and Legumes Oats, Cornflakes
- **DRINK PLENTY**: Water, Coconut Water, Chas (Butter milk), Fruit juice, Sports Drink, Lemon water, Soups, Green tea

**NUTRITIONAL SUPPLEMENTS**
Always in consultation with Doctor/Nutritionist
# ALWAYS CHOOSE HEALTHY FOOD ITEMS FOR OPTIMAL PERFORMANCE IN SPORTS

<table>
<thead>
<tr>
<th>FOOD ITEM/ GROUPS</th>
<th>Reduce intake of:</th>
<th>Add more of:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cereals &amp; Pulses</strong></td>
<td>Paratha, Butter nan, Biriyani, Kulcha, Vada, Puri, Refine bread, Burger, Hot Dog, Paties, Samosa, Kulcha</td>
<td><strong>Plain roti, Missi Roti, Rice, Pulav, Idli, Brown bread, Suji, Poha, Upma, Pasta, Dosa, Uttapam (with less oil), Khaman</strong></td>
</tr>
<tr>
<td><strong>Vegetables and Fruits</strong></td>
<td>Cooked vegetable with lots of oil, Fruit salad with cream, French Fries, Salad dressed with mayonnaise, Chips</td>
<td><strong>Green salad, Steamed or sautéd vegetables, All whole fruits (seasonal), Fruit chat, Fruit smoothie, Fresh Fruit Juice, Boiled potato</strong></td>
</tr>
<tr>
<td><strong>Milk &amp; Milk products</strong></td>
<td>Whole cow milk, Whole Buffalo Milk, Milk shake, Ice cream, Cheese spread, Dahi vada etc.</td>
<td><strong>Low fat milk, Yoghurt, Curd, Vegetable raita, Low fat paneer, Lassi</strong></td>
</tr>
</tbody>
</table>
### ALWAYS CHOOSE HEALTHY FOOD ITEMS FOR OPTIMAL PERFORMANCE IN SPORTS

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</thead>
<tbody>
<tr>
<td><strong>Meat/ Fish/ Egg</strong></td>
<td>Red Meat (Mutton, Pork etc.), Outer surface of fish, Chicken Leg, Raw egg, Omelette, Half/quarter fried egg</td>
<td>Fish/ chicken with less oil preparation &amp; little fat, Boiled egg without yolk, Egg white omelette, Chicken except leg part</td>
</tr>
<tr>
<td><strong>Soup and Beverages</strong></td>
<td>Any thick soup (with corn flour/butter/cream), Alcohol, Energy Drink, Carbonated drinks</td>
<td>Clear soup, Tomato soup, Lentil soup, Homemade vegetable soup, Fresh Fruit juice, Low fat milk shakes, Chas (Butter milk), Low fat Lassi, Coconut water, Sports drink</td>
</tr>
<tr>
<td><strong>Nuts</strong></td>
<td>Cashewnut, Fried and salted Cashew nut, Pistachio</td>
<td>Walnut, Almonds, Dates, Anjeer, Black til, Kishmish</td>
</tr>
</tbody>
</table>
Skimmed milk and double toned milk can be classified as low fat milk. Fat is almost nil in skimmed milk and double toned milk has 1.5% of fat.

Various milk brands in India sell double toned milk in yellow coloured packets. Skimmed milk is generally available in tetra pack (Milk cartons) stating skimmed milk or <0.5% of fat on it.

Cow milk has high percent of fat with buffalo milk having highest fat percent among various milks consumed in India. Just removing cream after refrigeration from the top of the milk does not reduce much of its fat content.

Paneer, curd, lassi made of skimmed milk or double toned milk are known as under low fat milk products.

Red meat is dark coloured meat like mutton, beef, pork, lamb, chicken leg etc. It has high percentage of fat in comparison to white meat like chicken breasts, fish etc. Regular intake of red meat can also increase the bad cholesterol (LDL-C) in your blood which can exert harmful effects on health and reduce performance.

Energy drinks are sweetened/ carbonated drinks with caffeine and other stimulants added in it. There are chances of contamination of prohibited substances which comes under doping by World Doping agency in energy drinks. Further if an athlete consumes energy drinks on a regular basis it will reduce the performance effect of caffeine on that athlete. Therefore regular consumption of sports drinks should be avoided.
**HEALTHY FOOD HABITS**

**Eat at least 500-700g of fruits and vegetables to get vitamins, minerals and antioxidants required to improve your performance.**

**Eat breakfast daily and never skip a meal. Take small frequent meals in the diet.**

**Have at least 10-15 minutes of sunlight exposure daily to get vitamin D for your body.**

**Have liver/mutton/beef 3 times a week to maintain iron status. Vegetarians should eat lots of green leafy vegetables, bajra, til etc. with lemon and citrus fruits. Excess of tea/coffee should be avoided.**

**Consume at least 500-750ml of low fat milk and milk products everyday to avoid calcium deficiency in the body. Calcium helps in making your bones and muscles strong.**

**Your plate should be full of various foods of different natural colors of rainbow to ensure a healthy and protective diet.**

**Do not consume protein rich food in excess amount. Protein alone can not serve all the purpose. Other food like cereals, fruits, vegetables are also important for your growth and improving performance.**
WHAT YOU SHOULD EAT BEFORE OR AFTER COMPETITION?

3-4 Hours Before competition or within 30 minutes after competition
- Bread with a thick layer of jam with milk
- Rice with boiled dal/chicken
- Chapati with boiled dal/chicken and curd
- Vegetable sandwich with milk shake
- Cornflakes/oats with Milk+ Banana
- Fruit Salad with Sweet Lassi

1-2 Hours Before Competition
- Milk Shake or Fruit Smoothie,
- Sports Bar,
- Cornflakes with Milk,
- Cereal Bars,
- Fresh Fruits.

Less than 1 hour Before Competition
- Sports Drink,
- Carbohydrate Jelly

FOODS TO AVOID BEFORE & DURING COMPETITION
- Chocolate, Carbonated drink (cold drink), Gulab-jamun, Laddu, Poori, Mutton, Pastry, Paties etc.
### FLUID REPLACEMENT GUIDELINES BEFORE AND DURING TRAINING

<table>
<thead>
<tr>
<th>Timing</th>
<th>Amount</th>
<th>Type of Beverage</th>
<th>Points to Remember</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before Activity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2 hours</td>
<td>500 ml</td>
<td>Plain cold water</td>
<td>Warmer fluids are appropriate in cool to cold environment.</td>
</tr>
<tr>
<td>10-15 minute</td>
<td>Upto 600 ml</td>
<td>Plain cold water, Diluted fruit juice, Glucose-electrolyte drink</td>
<td>Diluted fruit juice and electrolyte glucose drinks helps in enhancing performance in training lasting longer than 90 minutes.</td>
</tr>
<tr>
<td><strong>During Activity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every 10-15 minutes</td>
<td>150-250 ml</td>
<td>Plain cold water, Glucose electrolyte drink, Diluted fruit juice</td>
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### FLUID INTAKE AFTER ACTIVITY

- Body weight Before Training: 60Kg
- Body weight after training: 59Kg
- Weight loss of 1 Kg
- Replenish with 1 liter of water post exercise
- Fluid to be consumed within 2-3 hours after training
ASSESSING HYDRATION THROUGH URINE TEST

Are you Hydrated?

1. You are Hydrated.
2.
3. You are Dehydrated.
4.
5.
6.
7.
8.

Note: Vitamin supplements may change the urine color for few hours.

HOW TO MAKE SPORTS DRINK AT HOME?

4-8 Tea spoons of sugar/glucose/honey + 500ml of Water + Two pinches salt + ½-1 lemon = 500ml Sports Drink
NUTRITIONAL SUPPLEMENTS

Nutritional supplements are certain nutrients or purified food components which are generally required when an athlete is not consuming a balance diet as described earlier and requires support from these supplements. There are various nutritional supplements available in the market however very few of them are effective and safe to consume.

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**LIST OF SUPPLEMENTS* WHICH MAY BE EFFECTIVE AND SAFE TO CONSUME**

<table>
<thead>
<tr>
<th>Sports Food</th>
<th>Medical Supplements</th>
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</thead>
<tbody>
<tr>
<td>Sports drink</td>
<td>Iron supplement</td>
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<tr>
<td>Sports gel</td>
<td>Calcium supplement</td>
</tr>
<tr>
<td>Sports confectionery</td>
<td>Multivitamin/mineral</td>
</tr>
<tr>
<td>Liquid meal</td>
<td>Vitamin D₃</td>
</tr>
<tr>
<td>Whey protein</td>
<td>Probiotics (gut/immune)</td>
</tr>
<tr>
<td>Sports bar</td>
<td></td>
</tr>
<tr>
<td>Electrolyte replacement (Electrol)</td>
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</table>

<table>
<thead>
<tr>
<th>Performance Supplements</th>
<th>Polyphenols &amp; Others</th>
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</thead>
<tbody>
<tr>
<td>Caffeine</td>
<td>Quercetin</td>
</tr>
<tr>
<td>B-alanine</td>
<td>Curcumin (Turmeric)</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>Anti-oxidants C and E</td>
</tr>
<tr>
<td>Beetroot juice</td>
<td>Carnitine</td>
</tr>
<tr>
<td>Creatine</td>
<td>HMB</td>
</tr>
<tr>
<td></td>
<td>Glutamine</td>
</tr>
<tr>
<td></td>
<td>Fish oils</td>
</tr>
<tr>
<td></td>
<td>Glucosamine</td>
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*Based on Australian Institute of Sports classification

**Consumption of supplements not listed here will definitely not enhance the performance and may be harmful for the health.**
Always consult with a doctor/ nutritionist regarding the type of supplement, amount timing and frequency of the supplement to be consumed.

- Natural foods are best sources of nutrients and other beneficial components of food. Therefore adopting healthy food habits should be on priority.

- No food component/ nutrient and herbal product have been proven to be safe and effective as supplement other than the list provided along with.

- Always read the labels of the nutritional supplement to know what the ingredients present in that supplement are.

- There is always risk of contamination of prohibited substances in the nutritional supplements which can be detected under doping test. Sometimes these substances are not mentioned on the label but are present in supplement. There is no certification till now which guarantees the purity of supplement.

- Supplements should always be purchased from authorized dealers and caution should be taken while purchasing supplements online.

- Excess intake of nutritional supplements without any consultation can have negative impact on your health and performance.