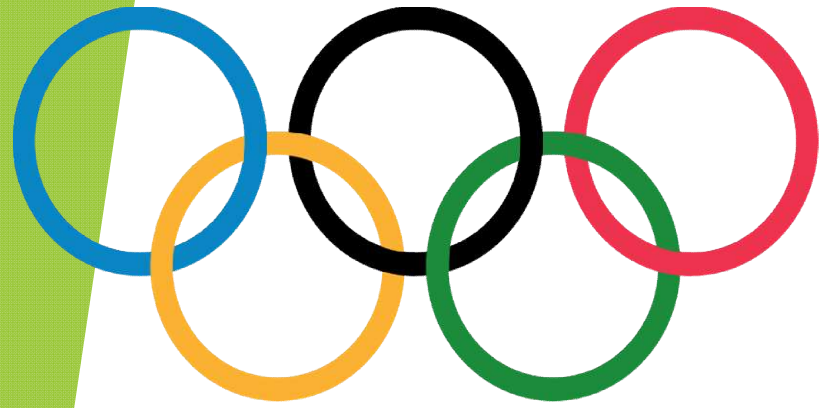

Sports Nutrition

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Director

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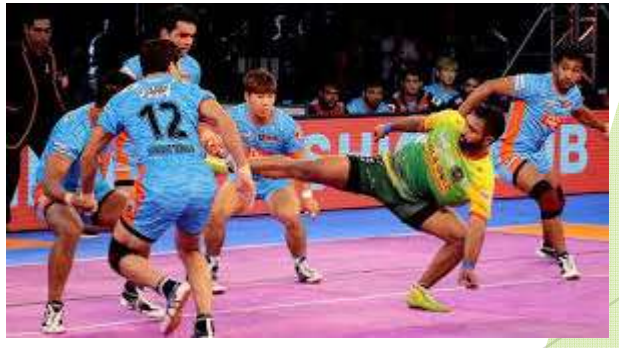


- Money
- Fame
- Ticket to National Teams

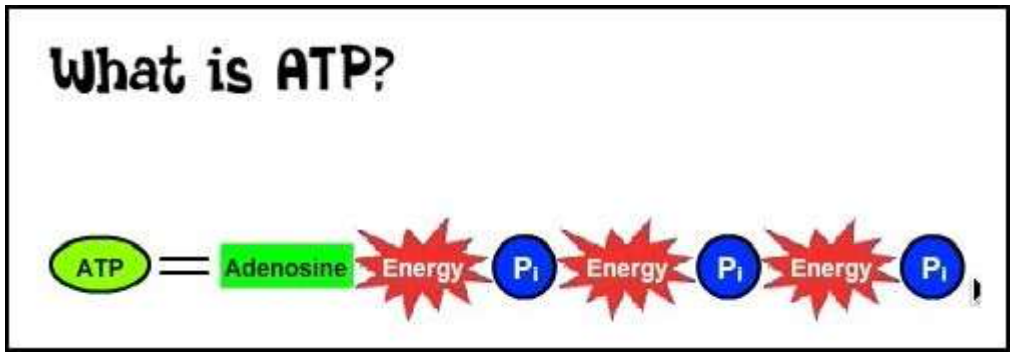
- Professionalism
- Intense Training
- Newer Techniques and aids
- Specialized Nutrition

Sports and Sports Nutrition

- **SPORTS** are competitions of physical strength, skill, or endurance against
  - Opponents – Cricket, Football, Hockey, Tennis, Chess
  - Objective standard such as time, height, or distance – Running, Jumping, Golf
- **Sports nutrition** is the study and practice of nutrition and diet with regard to improving anyone's athletic performance.
- **Major roadblock to performance is**
  - Fatigue
  - Dehydration
  - Injury
  - Other factors like Confidence, Attitude, etc – Sports Psychology

Energy System in Action

- Fatigue is due to failure in energy system
- ATP is the energy currency of life.
- Energy from the food we eat – Carbohydrates, Fat and Protein is stored in the form of ATP – Adenosine Triphosphate



Energy System in Action

- Three separate energy production systems
  - ATP-Phosphocreatine system
    - Weightlifting, Short sprints
    - Creatine supplementation to maximize muscle creatine
  - Anaerobic glycolytic system

Anaerobic. Very Quick. Very Short Duration. Rapid Fatigue

Anaerobic System. Quick Energy Rapid fatigue due to accumulation of acid

Energy System in Action

- Aerobic System

Requires Oxygen
Complex Process
Slow
Longer lasting with less fatigue

- Depending on the type of sport and physical activity, ATP pathway varies

Energy System in Different sports

- Following is a list of sports and approximate percentages of how much each of the energy systems contributes:

Sport	ATP-PC	Anaerobic Glycolytic	Aerobic
Field events (shotput, discuss)	90	10	0
Gymnastics	80	15	5
Hockey	50	20	30
Running (distance)	10	20	70
Soccer	50	20	30
Swimming (50m freestyle)	40	55	5
Tennis	70	20	10

Sportsperson's Diet

- An athlete’s diet should be similar to that recommended for the general public, with energy intake divided into:
- more than 55 per cent from carbohydrates
- about 12 to 15 per cent from protein
- less than 30 per cent from fat.
- Athletes who exercise strenuously – need to increase the amount of energy from carbohydrates to between 65 and 70 per cent.

Carbohydrates

- All Carbohydrates to Glucose to Glycogen as energy storage
- Low carbohydrate intake will lead to use of protein for energy
- Endurance exercise (1–3 hrs/day): 6–10 g/kg/day
- Extreme endurance exercise (more than 4 hrs/day): 8–12 g/kg/day
- Low GI food before training with low protein and fat – Cereal bars, low fat milk, pasta, Idli
- Moderate GI food during performance - sports gels, Sports bar, White bread sandwiches
- High GI food during and post training to shore up the glycogen storage with high intake of fluid – Sports drink, Glucose

Protein and Sporting Performance

- Plays a key role in post-exercise recovery and repair.
- Non-endurance events – consume between 1.0–1.2 g/kg of body weight per day. – Cricket
- Endurance events and strength events – consume between 1.2–1.7 g/kg of protein of body weight per day. – Swimming, Wrestling, Weightlifting

- Protein Supplement – Whey Protein is very commonly used. Branched chain amino acids Leucine, Isoleucine and Valine support endurance training

Water and Sporting Performance

- A loss of sweat equal to 2% of body weight - decrease of physical and mental performance.
- Dehydration may cause
  - a reduction in blood volume,
  - decreased sweat rate, decreased heat dissipation, increased core temperature
  - increased rate of glycogen use leading to accumulation of acid and fatigue
- Stay hydrated with water or Isotonic drinks

Sports Supplements

- Vitamins and Minerals – As a part of isotonic drink
  - B complex vitamins – Carbohydrate metabolism
  - Minerals – To compensate loss due to sweating
- Protein and Amino Acids
  - Whey Protein contains Branched chain amino acid
  - BCAA – Leucine, Isoleucine and Valine – Directly used by muscle during exercise
  - Casein – Slow digestion – post work out. Night protein
  - Glutamine – Work out and injury recovery

Sports Supplements

- Creatine
  - Involved in Phoshocreatin Energy system
  - Present in skeletal muscle and is also indigenously produced
  - Converts ADP to ATP in muscles thereby producing energy – anaerobically
- Caffeine based energy drinks with Inositol, Gluco delta lactone, Taurine
- D Ribose – Supports ATP synthesis – High Intensity work out
- Hydroxy methyl butyrate – Decreases muscle breakdown

Sports Supplements

- *Ginkgo biloba* leaf extract – claim to improve aerobic endurance by enhancing muscle tissue oxidation.

- Ginseng - Cardiovascular or aerobic endurance performance
- Guarana – Source of Caffeine
- Green Tea extracts – Antioxidant and enhances endurance performance
- Ginger – Fatigue resistance and anti inflammatory
- Fenugreek – Endurance enhancement

Anti Doping Regulations

- World Anti Doping Agency - WADA
- The Indian Arm – National Anti Doping Agency
- A long list of banned performance enhancing substances like
  - steroids, growth hormones,
  - Diuretic agents,
  - Stimulants like Cocaine, Amphetamine, Ephedrine ,
  - Narcotics like Morphine
- In all major sport events, all medal winners are tested for banned substances
- In addition, random testing is done on athletes during the game and off the game
- If found guilty, the medals are withdrawn and athletes are banned for a certain period of time or for life

Sportsman's Spirit

- In a fair manner
- NO to banned substances

- Thank You