NUTRITIONAL RECOMMENDATIONS IN BOXING

Parul Tyagi
Nutritionist
SAI,NCOE Rohtak
Performance in Boxing through Nutrition

**Requirements**

- To maintain muscle strength
- To keep high levels of energy to last through-out the duration of bout.
- To avoid the feeling of tiredness and sluggishness.
- To avoid getting injuries.

**Benefits**
Meeting your Requirements

Total energy requirement of athletes depends on:
• Age, height, weight
• Sport played.
• Position on field
• Daily training load.
• Competition schedule.
# Energy Requirements for Physical Activity

<table>
<thead>
<tr>
<th>Physical activity level</th>
<th>kcal/kg/day</th>
<th>kcal/da</th>
</tr>
</thead>
<tbody>
<tr>
<td>General physical activity</td>
<td>Normal diet, 25-35</td>
<td>1 800-2 400(^a)</td>
</tr>
<tr>
<td>30-40 minutes/day, 3 times a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal diet, 25-35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate levels of intense training</td>
<td>50-80</td>
<td>2 500-8 000(^c)</td>
</tr>
<tr>
<td>2-3 hours/day, 5-6 times a week(^b)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-volume intense training</td>
<td>50-80</td>
<td>2 500-8 000(^c)</td>
</tr>
<tr>
<td>3-6 hours/day, 1-2 sessions/day, 5-6 times a week(^b)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elite athletes(^d)</td>
<td>150-200</td>
<td>Up to 12 000(^e)</td>
</tr>
<tr>
<td>Large athletes(^e)</td>
<td>60-80</td>
<td>6 000-12 000(^f)</td>
</tr>
</tbody>
</table>

\(^a\): Values estimated for a 50-80 kg individual
\(^b\): Moderate levels of intense training use lower level of range, high-volume intense training uses upper level of range
\(^c\): Values estimated for a 50-100 kg individual
\(^d\): Depending on training periodisation, and the volume and intensity of training
\(^e\): Values estimated for a 60-80 kg athlete
\(^f\): Values estimated for a 100-150 kg athlete
Macronutrients

**WHAT?**

PROTEIN, CARBOHYDRATES, FAT

Protein: 4kcal per g | Carbs: 4kcal per g | Fat: 9kcal per g

**WHY?**

ENERGY, GROWTH, IMPORTANT BODY FUNCTIONS

All three macronutrients are necessary in certain amounts to ensure a functioning body and a healthy metabolism.

**WHERE?**

IN ALL FOODS

Protein: meats, fish, eggs, legumes [...]  
Carbs: Fruit, starches, vegetables [...]  
Fat: meat, nuts, diary [...]
Meal Timing

- Breakfast/post training
- Lunch
- Dinner

Pre-Training

Pre-Training

Post-Training
Boxers should eat natural carbohydrates such as, whole-wheat grain, fruits, and oatmeal, which are packed full of useful nutrients. Carbohydrates is a key nutrient for boxers. The critical source of energy for exercising muscles. A little from blood glucose & a large amount from glycogen stored in the muscles. The body can only store a limited amount of glycogen in liver so it is essential to eat carbohydrate everyday.
# Carbohydrate Requirement for Physical Activity

<table>
<thead>
<tr>
<th>PHYSICAL ACTIVITY LEVEL</th>
<th>g/kg BW/day</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>low intensity or skill based 1hr/day</td>
<td>3-5g/kg/day</td>
<td>Include Pre, During and Post training intake.</td>
</tr>
<tr>
<td>Moderate to high intensity -3hr/day</td>
<td>5-7/kg/day</td>
<td>Individuals tolerance and preference.</td>
</tr>
<tr>
<td>moderate to high intensity &gt;4-5hr</td>
<td>8-12g/kg/day</td>
<td>Nutrients- dense choices.</td>
</tr>
</tbody>
</table>

ref-ACSM,IOC,ISSN
## Common food source containing high carbohydrate

<table>
<thead>
<tr>
<th>Food source</th>
<th>Amount</th>
<th>Carbs (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapatti</td>
<td>60g</td>
<td>41.64</td>
</tr>
<tr>
<td>Rice</td>
<td>30g</td>
<td>23.46</td>
</tr>
<tr>
<td>Boiled potato</td>
<td>50g</td>
<td>11.3</td>
</tr>
<tr>
<td>Bread (wheat)</td>
<td>60g</td>
<td>29.4</td>
</tr>
<tr>
<td>Banana</td>
<td>100g</td>
<td>27.2</td>
</tr>
<tr>
<td>Pineapple</td>
<td>100g</td>
<td>10.8</td>
</tr>
<tr>
<td>Orange</td>
<td>100g</td>
<td>10.9</td>
</tr>
<tr>
<td>Raisins</td>
<td>10g</td>
<td>7.46</td>
</tr>
<tr>
<td>Dry dates</td>
<td>20g</td>
<td>15.16</td>
</tr>
<tr>
<td>Jaggery</td>
<td>10g</td>
<td>9.5</td>
</tr>
</tbody>
</table>

Source: Indian food composition tables, NIN
What happens when carbohydrate intakes are low

• Decreased performance
• Muscle loss (protein used for energy)
• Fatigue
• Nutrient deficiency
• Irritability
Carbohydrates to limit in the diet

- Sugar
- Soda
- Artificial sweetener
- Candies
- Pastries and cakes
- Fried potatoes, chips etc.
Protein

Role of protein:-

• Tissue maintenance
• Tissue repair
• Tissue growth
• Protein can also provide energy if glycogen stores in muscles & the liver are low but if it is used this way, it is then not available for the important job of muscle growth, repair & recovery.
# Protein Requirement for Physical Activity

<table>
<thead>
<tr>
<th>PHYSICAL ACTIVITY LEVEL</th>
<th>g/kg BW/day</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>General fitness</td>
<td>0.8-1.0 g/kg</td>
<td>Focus on protein quality.</td>
</tr>
<tr>
<td>Older individuals</td>
<td>1.0-1.2 g/kg</td>
<td></td>
</tr>
<tr>
<td>Moderate amount of intense training</td>
<td>1.0-1.5 g/kg</td>
<td></td>
</tr>
<tr>
<td>High volume of intense training</td>
<td>1.5-2.0 g/kg</td>
<td></td>
</tr>
</tbody>
</table>
## Common food source containing Protein

<table>
<thead>
<tr>
<th>Food source</th>
<th>Amount</th>
<th>Protein (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiled eggs(white)</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Chicken breast</td>
<td>30g</td>
<td>6.5</td>
</tr>
<tr>
<td>Fish(rohu)</td>
<td>100g</td>
<td>16.6</td>
</tr>
<tr>
<td>Milk(toned)</td>
<td>200ml</td>
<td>7.8</td>
</tr>
<tr>
<td>Curd</td>
<td>100g</td>
<td>3.1</td>
</tr>
<tr>
<td>Cheese slice</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Dal(lentil)/Beans</td>
<td>30g</td>
<td>7.53</td>
</tr>
<tr>
<td>Soya milk</td>
<td>120g</td>
<td>10</td>
</tr>
</tbody>
</table>

source: Indian food composition tables, NIN
Proteins to limit in the diet

• Fried chicken
• Certain dairy products-
  • Ice cream
  • Paneer made with whole milk
  • Curd made with whole milk
POST TRAINING MEAL (RECOVERY MEAL)

- First 4-6 hours are crucial for optimal recovery and repair.

- Carbohydrate: 1g/kg
- Protein: 0.2-0.5g/kg
- Carbohydrate: Protein = 3:1 ratio

Within 30 minutes after training
Dietary fat play an important role in the body including insulation from the cold & aiding in the absorption & transportation of the fat-soluble vit A,D,E & K.
How much is enough

- The fat requirement should be 25% of total calories.
- It should not more then 30% of total calories.
- High fat diet can lead to long term health problem.
- Focus on monounsaturated fats & omega-3 fatty acids.
FATS to limit in the diet

• Cream
• Ice cream
• Margarine
• Trans fats-
  – Chips
  – Bakery products
• Hydrogenated fats
Fruits & Vegetables

• Nutrients dense, low energy foods.

• Provide a wide range of essential vitamins & minerals.
Eating to compete
Goal: To provide adequate carbohydrate energy & optimal hydration

- It takes 1-4 hours for food to leave your stomach
- High glycemic index carbohydrate foods are digested quickly
- High protein foods can increase water requirements
- Foods high in fat can stay in your stomach for more than hours

- Best choice for pre-game meals is something high in carbs-easy to digest & becomes quick energy
3-4 HOURS BEFORE EXERCISE:

- Baked potato + cottage cheese filling + glass of milk
- Bread roll with cheese/meat filling + banana
- Fruit salad with fruit – flavored yoghurt
- Vegetable sandwich with milk shake
- Cornflakes/oats with Milk+ Banana
- Rice with boiled dal/chicken
- Chapati with boiled dal/ chicken and curd
- Bread with a thick layer of jam with milk
1-2 hours Before Exercise:

- Milk shake
- Fruit smoothie
- Sports bar (check labels for carbohydrate and protein content)
- Breakfast cereal with milk
- Cereal bar
- Fruit-flavoured yogurt
- Fruit
LESS THAN 1 HOUR BETWEEN EVENTS:

- Sports drink
- Carbohydrate gel
- Sports bar
- Jelly
During competition

- Refueling for ‘Tournament’ play:
- Types of food/fluid may differ depending on times between rounds or games
- Sports drinks, fruits, low fat flavored milk and sports bars.
POST EVENT MEAL

- In the first 30 minutes:
  - replace fluids & electrolytes
  - eat high-carbohydrate foods
- Examples-banana, yogurt, bar, white bread
- Within 2 hours:
  - drink 2-3 cups of fluid for every pound lost
  - eat a high – carbohydrate meal with some protein
- Example-ham sandwich, rice and beans
• Water is about 70-75 per cent of body weight is an individual with normal body weight.

• Body water balance is maintained when water intake is equal to water loss.

• Heavy exercise sweat losses are about 1 to 2 L/h depending on intensity and duration, temperature, humidity etc.
## Fluid Replacement Guidelines

<table>
<thead>
<tr>
<th>Timing</th>
<th>Amount</th>
<th>Type of Beverage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before Activity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2 hours</td>
<td>500 mL</td>
<td>Plain cold water</td>
</tr>
<tr>
<td>10-15 minute</td>
<td>Up to 600 mL</td>
<td>Plain cold water, diluted fruit juice, glucose-electrolyte drink</td>
</tr>
<tr>
<td><strong>During Activity</strong></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>
</tr>
<tr>
<td><strong>After Activity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediately to 2-3 hours</td>
<td>Begin immediately</td>
<td>Compensate loss in body weight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plain water, glucose electrolyte drink</td>
</tr>
</tbody>
</table>
## Symptoms and Results of Dehydration

<table>
<thead>
<tr>
<th>Dehydration % of body weight</th>
<th>Symptoms and results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>Thirst</td>
</tr>
<tr>
<td>2%</td>
<td>Stronger thirst, loss of appetite</td>
</tr>
<tr>
<td>3%</td>
<td>Reduction in urinary output, dry mouth</td>
</tr>
<tr>
<td>4%</td>
<td>Increased effort for physical work, flushed skin, impatience, sleepiness, nausea, emotional instability</td>
</tr>
<tr>
<td>5%</td>
<td>Difficulty in concentrating</td>
</tr>
<tr>
<td>6%</td>
<td>Impairment in exercise temperature regulation, increases pulse and respiratory rate</td>
</tr>
<tr>
<td>8%</td>
<td>Dizziness, labored breathing with exercise, indistinct speech, increasing weakness, mental confusion</td>
</tr>
<tr>
<td>10%</td>
<td>Spastic muscles, inability to balance with eyes closed, delirium and wakefulness, swollen tongue</td>
</tr>
<tr>
<td>11%</td>
<td>Circulatory insufficiency, decreased blood volume, failing renal function</td>
</tr>
<tr>
<td>15%</td>
<td>DEATH</td>
</tr>
</tbody>
</table>
Methods to assess hydration status of the body

- **The Urine test:** When fully hydrated, large amounts of very pale yellow urine will be passed.
- The urine color will change from pale yellow to dark yellow and sometimes to apple red in condition of severe dehydration.
- Sometimes dark yellow urine is because of vitamin B Complex supplements.
- Therefore if consumed supplements urine test should be done 7-8 hours after consumption of supplements.
Athlete Should Know:

- Sports specific eating habits.
- Taste should not be driving force.
- Do not follow your fellow athletes eating habits.
- Do not reward yourself with food.
- Keep your diet history.
- Always watch your weight.
- Educating yourself from reliable sources.
- Supplement are not magic pills.
Thank You