

Sports Nutrition and Performance

Fueling Athletic Performance: Evidence-Based Sports Nutrition

Introduction Sports nutrition focuses on optimizing dietary intake to enhance athletic performance, support training adaptations, improve recovery, and maintain health. Proper nutrition timing and composition can significantly impact training quality and competitive outcomes.

Pre-Exercise Nutrition

Timing and Goals:

- 3-4 hours before: Large meal with carbs, moderate protein, low fat/fiber
- 1-2 hours before: Smaller meal, primarily carbohydrates
- 30-60 minutes before: Easily digestible carbs, minimal protein/fat

Pre-Workout Meal Composition:

- Carbohydrates: 1-4g per kg body weight (depending on timing)
- Protein: 0.25g per kg body weight
- Fat: Minimal to moderate (depending on timing)
- Fluid: 5-10ml per kg body weight 2-4 hours before

Example Pre-Exercise Meals:

- 3 hours before: Oatmeal with banana and almond butter, Greek yogurt
- 1 hour before: Toast with jam, small banana
- 30 minutes before: Sports drink, dates, or energy gel

During-Exercise Nutrition

Exercise Duration Guidelines:

- Less than 60 minutes: Water only
- 60-90 minutes: 30-60g carbs per hour
- Over 90 minutes: 60-90g carbs per hour (multiple carb sources)

Carbohydrate Sources During Exercise:

- Glucose-based: Sports drinks, gels, bananas
- Fructose combination: For extended exercise (glucose + fructose = better absorption)
- Electrolyte replacement: Sodium 300-600mg per hour in hot conditions

Hydration During Exercise:

- Start well-hydrated
- Aim for 150-250ml every 15-20 minutes
- Include electrolytes for sessions over 1 hour
- Monitor urine color and body weight changes

Post-Exercise Recovery

The Recovery Window:

- Immediate (0-2 hours): Most critical for glycogen resynthesis
- Extended (2-24 hours): Continued protein synthesis and adaptation

Post-Workout Nutrition Targets:

- Carbohydrates: 1.0-1.2g per kg body weight within 2 hours
- Protein: 20-25g high-quality protein within 2 hours
- Fluid: 125-150% of fluid losses (weigh before/after exercise)
- Electrolytes: Replace sodium and potassium losses

Optimal Recovery Foods:

- Carb + Protein combinations: Chocolate milk, Greek yogurt with fruit, turkey sandwich
- Whole food options: Sweet potato with chicken, quinoa salad with beans
- Convenient options: Recovery smoothie, protein bar with fruit

Sport-Specific Considerations

Endurance Sports (Running, Cycling, Swimming):

- Higher carbohydrate needs: 6-10g per kg body weight daily
- Practice fueling strategies during training

- Focus on glycogen storage and replacement
- Emphasize hydration and electrolyte balance

Strength and Power Sports (Weightlifting, Sprinting):

- Moderate to high protein: 1.6-2.2g per kg body weight
- Adequate carbohydrates for high-intensity training: 5-7g per kg
- Creatine supplementation may benefit power output
- Focus on meal timing around training sessions

Team Sports (Soccer, Basketball, Hockey):

- Balanced macronutrient approach
- Emphasize carbohydrate availability for intermittent high-intensity efforts
- Strategic fueling for tournament play or multiple games
- Recovery nutrition between games or practices

Body Composition Goals

Building Muscle Mass:

- Caloric surplus: 300-500 calories above maintenance
- High protein intake: 1.8-2.2g per kg body weight
- Adequate carbohydrates to fuel training: 4-6g per kg
- Resistance training with progressive overload

Fat Loss While Maintaining Performance:

- Moderate caloric deficit: 300-500 calories below maintenance
- High protein intake: 2.0-2.4g per kg body weight
- Strategic carbohydrate timing around training
- Maintain training intensity while in deficit

Key Performance Supplements

Evidence-Based Supplements:

- Creatine monohydrate: 3-5g daily for power and strength

- Caffeine: 3-6mg per kg body weight 30-60 minutes before exercise
- Beta-alanine: 3-5g daily for high-intensity endurance (>1 minute)
- Nitrate/beetroot juice: 5-9mmol nitrate 2-3 hours before endurance exercise

Conditionally Useful:

- Protein powder: Convenient protein source when whole foods aren't available
- Sports drinks: For exercise longer than 60 minutes
- BCAAs: Only beneficial if total protein intake is inadequate

Practical Implementation:

- Periodize nutrition with training phases
- Practice race-day nutrition during training
- Individual tolerance varies - test strategies in training
- Work with a sports nutritionist for personalized plans
- Monitor performance, recovery, and health markers