Fueling Strategies for Competitive Athletes

Becci Twombley, RD CSSD
Director of Sports Nutrition
University of Southern California

Fuel ON!
Healthy Cells Recover Faster

• Every food has a purpose.
• Choosing the right foods will help you achieve your goals more quickly.
• Choosing the wrong foods can sabotage your progress.
• Our job is to help you know your purpose.
Formal Education

- Sports Medicine
- Kinesiology
- Biomechanics
- Anatomy/Physiology
- Biochem
  - Metabolism
  - Ergogenic pathways
- Sport Specific demands
- MNT
- Meal planning
- Food safety
- Pre/during and post competition nutrition
- Counseling
- Weight Management
- Public Speaking
- Management

Did you know?
You can specialize in sports Dietetics through the CDR.

CSSD: Board Certified Specialist in Sports Dietetics

For more information: www.sportsRD.org
“They won’t care how much you know until they know how much you care”

Rules
Lingo
Strategy
Positions
Nuances
Schedule
What do Athletes REALLY Need to Know?
Purposeful Eating

• Purpose of Macronutrients
• Nutrient Timing
• Portion Size
• Nutrition Periodization
  – Pre-season
  – Competition
  – Bulking Phase
YOU CAN’T OUT TRAIN BAD NUTRITION

Supplements

- ENERGY BALANCE
- FREQUENCY
- TYPE
- Supplements
Adjust your Fueling to your Training

EASY TRAINING / WEIGHT MANAGEMENT
- Whole Grains
- Pasta
- Rice
- Potatoes
- Cereals
- Breads
- Legumes
- Poultry
- Beef/Game/Lamb
- Fish
- Eggs
- Low-Fat Dairy
- Soy (e.g., tofu, tempeh)
- Legumes/Nuts
- Raw Veggies
- Cooked Veggies
- Veggie Soups
- Fresh Fruit

MODERATE TRAINING
- Grains
- Pasta
- Rice
- Potatoes
- Cereals
- Breads
- Legumes
- Poultry
- Beef/Game/Lamb
- Fish
- Eggs
- Low-Fat Dairy
- Soy (e.g., tofu, tempeh)
- Legumes/Nuts
- Raw Veggies
- Cooked Veggies
- Veggie Soups
- Fresh Fruit
- Slowed Fruit
- Dried Fruit

HARD TRAINING / RACE DAY
- Grains
- Pasta
- Rice
- Potatoes
- Cereals
- Breads
- Legumes
- Poultry
- Beef/Game/Lamb
- Fish
- Eggs
- Low-Fat Dairy
- Soy (e.g., tofu, tempeh)
- Legumes/Nuts
- Cooked Veggies
- Veggie Soups
- Fresh Fruit
- Slowed Fruit
- Dried Fruit

SOURCE: United States Olympic Committee Sport Dietitians
University of Colorado Sport Nutrition Grad Program
Leptin

Adequate Food

BRAIN / HYPOTHALAMUS

- Testosterone/Estrogen
  - Bone Formation
  - Muscle Growth

- Growth Hormones
  - Build Lean Muscle
  - Bone Formation

- Thyroid Hormones
  - Normal Metabolic Function

- Normal Stress Hormone Levels
  - Fat Metabolism
Recovery Goals:

• Tissue Repair
  • Training is intentional trauma that creates micro tears in tissues.
  • Recovery nutrition’s ultimate goal is to speed the hypertrophy of the connective tissue, muscle and skeleton to create a more resilient athlete.

• Improved Blood Flow
  • Vasoconstriction due to the stress response propagates the inflammatory process.
  • Increasing vessel size allows for improved nutrient delivery at the cellular level.

• Decreased Fatigue
  • Electrolyte replacement and buffering of lactic acids to improve endurance.
  • Carbohydrate ingestion to prevent muscle breakdown.
  • Boost Immune System
Typical symptoms of overreaching in trained endurance athletes

- Reduced performance and high perceived fatigue
- Decreased heart rate values at all exercise intensities, including at exhaustion
- Altered cognitive performance above lactate threshold
- Increased rate of perceived exertion at submaximal intensities
- Reduced blood lactate concentration at both submaximal & maximal intensities
- Higher prevalence of infections
- Disturbed sleep quality
- Disturbed mood
Beyond the Basics
Whey - Leucine

• 20% of cows milk is whey protein
• Whey is considered the fast protein due to its quick digestion and absorption which means you can get the protein to the muscles faster and start the recovery process
• Whey has the highest bioavailability of any protein
• Why should I consume whey?
  • High intensity or prolonged activity can result in decreased leucine stores up to 30%
  • Important to consume post-workout to replenish Leucine

Whey protein is high in the amino acid leucine (about 10%)

• Recommended to have at least 2.5g at each meal
• Leucine is highest in whey protein, Greek yogurt, and steak

1 cup milk = 1 gram leucine

1 serving Greek yogurt = 2.5g leucine

3 egg omelet = 1.5g leucine

100% WHEY CONCENTRATED & ISOLATED WHEY PROTEIN – VANILLA 6lbs/2722g

NUTRITION FACTS
Serving Size: 60g (3 scoop) (1 scoop)
Servings Per Container 25

Amount Per Serving
Calories 140 Calories from Fat 69
Total Fat 2.5g 4%
Saturated Fat 1.5g 8%
Trans Fat 0g
Cholesterol 70mg 23%
Sodium 110mg 5%
Potassium 160mg 5%
Total Carbohydrate 3g 1%
Sugars 2g
Protein 27g 54%

Calcium 10%
*%DIETARY REFERENCE INTAKE

Nutrients %DV
Calories 140
Fat 2.5g
Carbohydrate 3g
Protein 27g
Sodium 110mg
Cholesterol 70mg

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

1 cup milk = 1 gram leucine

1 serving Greek yogurt = 2.5g leucine

3 egg omelet = 1.5g leucine

Nutrient Highlight

Nutrients %DV
Calories 140
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Background

- Your ligaments connect bone to bone and tendons connect muscle to bone.
- Strong ligament and tendons are crucial for prevention of ACL injuries which are 4 times as high in female athletes compared to males. Collagen is the protein that strengthens those.

What is it?

- Gelatin is an animal derived protein that contains high amount of proline and glycine which is important in building collagen.

Collagen builder smoothie

*Ingredients:*
- 1 cup kale/spinach
- 1 cup frozen blueberries
- 6 oz plain greek yogurt
- 1 packet Knox gelatin
- 1 Tbsp Chia seeds
- ½ banana

Why?

- A combination of vitamin C and gelatin has been shown to improve collagen levels helping to strengthen the ligaments and tendons before a workout.

Recommendation

- 2-5 grams or 1 packet Knox Gelatin with 1000mg vitamin C (2 cups orange juice) 30-60min BEFORE practice.
Vitamin D

- Body naturally produces vitamin D, however many athletes are deficient even in sunny locations
  - **Deficient:**
    - Poor muscle function (especially in fast-twitch muscle fibers)
    - Greater risk for stress fractures, muscular pain, viral respiratory infections, various diseases
    - Decreased neuromuscular control = poor coordination
    - Unable to produce force and velocity at the optimal level.

- Vitamin D helps the body absorb calcium, which is crucial for bone health
- Acts directly on the muscle to increase protein synthesis
- Increases cellular integrity and hormone function to boost immunity... especially in respiratory disease.

Ideal level for athletes is about **50ng/ml**

**Take Home:** In those who are deficient in vitamin D, supplementation resulted in improvements to athletic performance.
• Speed recovery
• Reduced inflammation
• Deeper/restful sleep
• Facilitate healthy nerve function

Data shows efficacy for cherry juice in decreasing some of the symptoms of exercise induced muscle damage.
• Most notably, strength loss averaged over the four days after eccentric exercise was 22% with the placebo but only 4% with the cherry juice.

Beets

High in betalins and beta-carotene making it top of the charts for antioxidants (important for immune and staying healthy) and anti-inflammation. Careful when cooking – long cooking times kill betalins

Beets are a vasodilator which increase the blood flow and therefore nutrients to muscles

Beets also are unique in their high content of nitrates

Dietary nitrate supplementation, in the form of beets or beet root juice, has become popular in light of recent studies documenting its ergogenic effects on exercise economy/efficiency and endurance performance (Jones, 2014).

This means that it requires less energy (calories) to perform at the same intensity – prolonging how long you can perform.

Acute Supplementation:

• 5-7mmol dietary nitrate 2.5 hrs before training
  • 2 concentrated beet root juice shots
  • 3-5 beets – raw/juiced

To prepare:

Juice beets
Chop and steam for 15 minutes/roast for 30
Add cooked beets or raw leaves to salads, quinoa, etc.
Add raw beet to smoothies

Did you know?

Beet tops are higher in nutrients – specifically nitrates – than the beet root. Try blending them into smoothies or sautéing them with other vegetables!

For more information: http://www.gssiweb.org/Article/sse_110-dietary-nitrate-the-new-magic-bullet
When we say *juicing* we don’t mean an all juice diet, popular in fad diets. Juicing can be a healthful boost to any diet if consumed within energy needs. Juicing is a great way to get a *variety of nutrients* into your body *quick* without the full feeling of eating a lot of fruits and vegetables since the fiber is removed. There is no benefit to consuming the juice versus the fruit itself, but you can get a higher amount of nutrients with juicing, especially for those who struggle to eat vegetables.

The high content of vitamins, minerals, and antioxidants promote general wellness, boost your immune system to keep you in the game, attack free radicals, guard against cellular damage, and reduce inflammation.

Safety Tip: Remember to always wash the produce first and choose organic when using the peel.

**A great guide to juicing is (Aim for 3-1 vegetable to fruit ratio):**

- Green vegetable as a base
- High-water fruit or vegetable for hydration
- Fruit (for sweetness)
- Kick (for flavor)

**These are some ingredients to include:**

- **Base**: kale, spinach, collard green, celery
- **High-Water**: Cucumber, watermelon, grapefruit
- **Fruit**: Apple, Carrot, Beet, pineapple
- **Kick**: ginger, cayenne, arugula, lemon

**Go for Green Juice Recipe**

*Ingredients:*
- 1 cup kale
- 1 cup spinach
- 1/2 cup pineapple
- 2 medium green apples
- 1 mint sprig
Decreasing Fatigue
Considerations in setting daily carbohydrate intake targets for athletes by Burke & Mujika IJSNEM 2014

Daily carbohydrate intakes for athletes should be periodized according to a number of changing factors. Factors identified with solid black arrow represent the major factors that determine carbohydrate intake targets whereas the unfilled arrows represent factors that may modify carbohydrate intakes.
Probiotics for GI health

The gateway for nutrients into the body
**Buffers**

- Very-high-intensity events use the anaerobic energy system
- The body has systems to help buffer the excess acid (balance the pH)
- **Sodium bicarbonate** and **B-Alanine** have been used to provide extra buffering.
  - Dose: about 0.13 grams (3 grams per kilogram) of bicarbonate citrate/pound of body weight, 1 to 2 hours before high-intensity events.
  - **Negative**: gastrointestinal upset reported
  - Supplementation of bicarbonate and beta-alanine elevated buffering potential by increasing muscle carnosine and blood bicarbonate levels, respectively.
- Results show that BA improved high-intensity cycling capacity
- B-Ala has been shown to increase exercise capacity and performance of several types, particularly where the high-intensity exercise range is 1-4 min

Supplements

How do you know which ones are safe?
Athleticism is by and large genetic.

Great fueling allows the athlete to be MORE RESILIENT.

The Sports RDs job is to make sure the athlete understands food as fuel to aid in recovery.