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COLLEGIATE & PROFESSIONAL SPORTS DIETITIANS ASSOCIATION

# PERFORMANCE NUTRITION INFOGRAPHICS: Tips for Athletic Trainers and Coaches



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**THE RIGHT STUFF**  
Serious Hydration  
for Serious Athletes™

SERIOUS HYDRATION FOR SERIOUS ATHLETES™

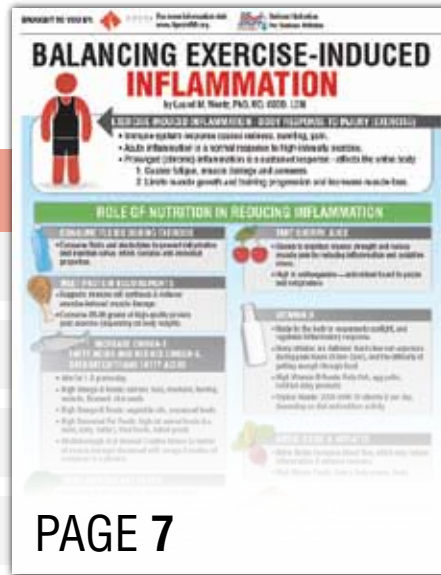


The Collegiate and Professional Sports Dietitians Association (CPSDA) is a national membership organization for sports dietitians. CPSDA leads the way in applied performance nutrition, advocates for the advancement of performance nutrition infrastructure, drives job growth and provides members with tools to support their full career development.

For more information or to join CPSDA, please visit [www.sportsrd.org](http://www.sportsrd.org)

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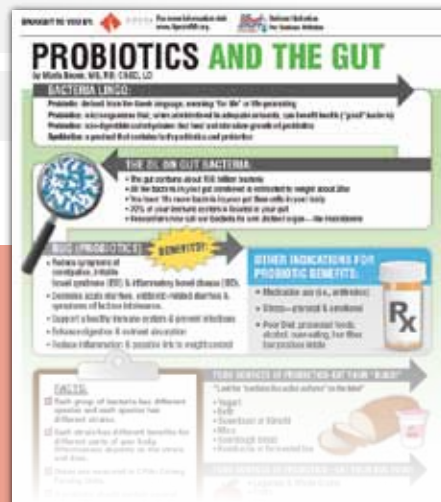
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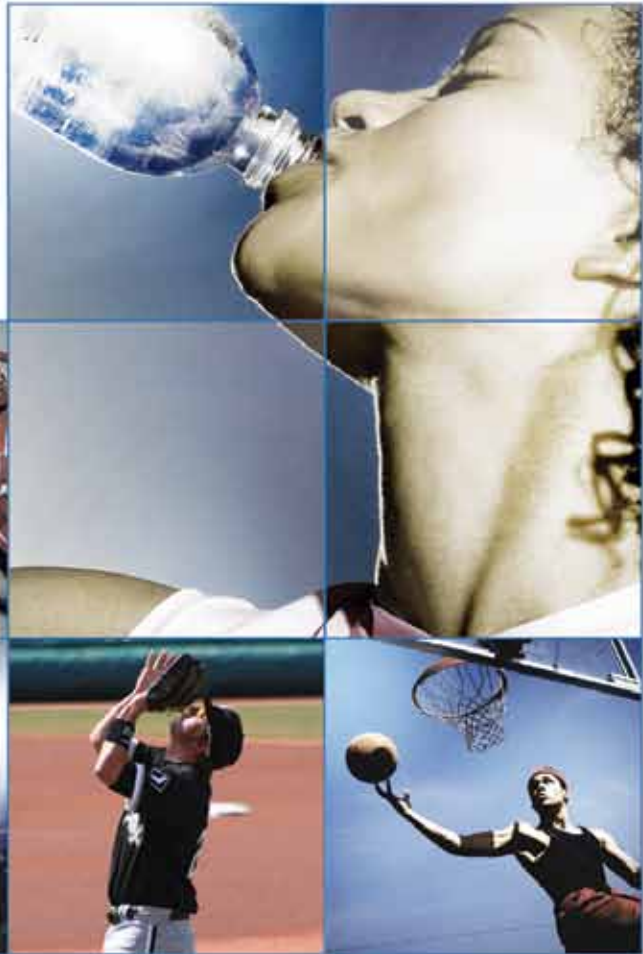


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Coaches, athletic trainers, strength coaches and other allied healthcare members working with athletes can use these infographics to educate athletes at all skill-levels on the benefits of fueling for performance. Each page can be downloaded and printed and then shared individually or as a group.

# SERIOUS HYDRATION FOR SERIOUS ATHLETES

**THE  
RIGHT  
STUFF**  
Zero Carb Electrolyte Liquid Drink Additive  
NASA  
DEVELOPED



Cramps, headaches, muscle fatigue and light-headedness are just some of the symptoms caused by dehydration. Exertion, sun exposure, humidity and high altitude all contribute to the body's loss of water and electrolytes.

Numerous studies show, this NASA-developed formula is far superior for:

- Fighting cramps, headaches, muscle fatigue due to sweating and electrolyte loss.
- Improving core thermoregulation; protecting the body from overheating in times of high exertion and in high heat settings.
- Increasing endurance over 20% more than any other NASA-tested formula.

The Right Stuff® helps optimize athletic performance in all sports, from football to golf; water sports to motor sports; running to cycling! The Right Stuff is hydrating athletes in High Schools and Colleges across the US, all major professional sports leagues and Olympians.



[TheRightStuff-USA.com](http://TheRightStuff-USA.com)

## SAMPLE OFFER:

Contact us at [samples@wellness-brands.com](mailto:samples@wellness-brands.com) to find out if you qualify to receive free samples to test with your athletes. Please provide your name, phone, email, mailing address, name of organization (High School, College, Club, Team) and number of athletes supported.





# WHAT'S IN YOUR SWEAT?

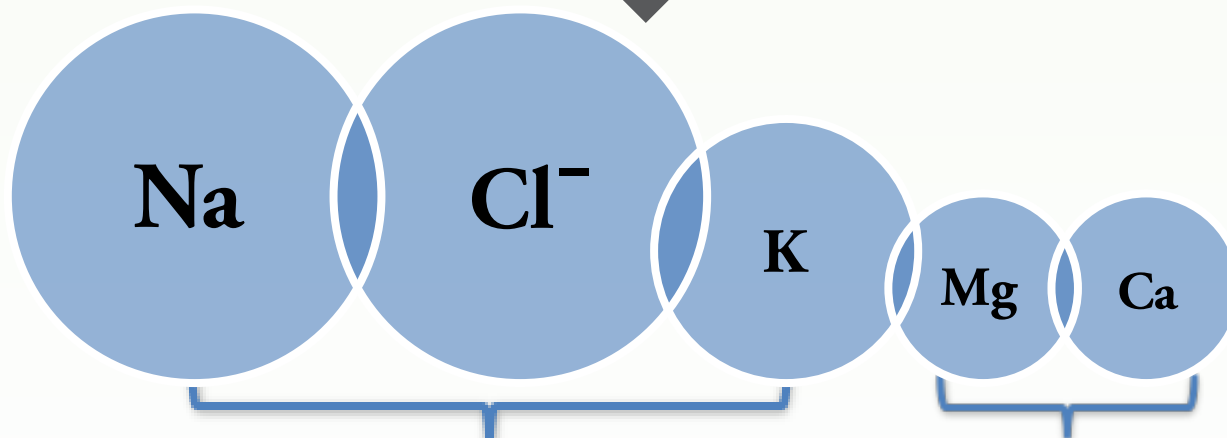
by Taylor Sherman, EP-C, ACSM; Claire Siekaniec, MSc, RD, CSSD; Shelby Johnson, RD

The average athlete loses 1-3L sweat/hour. **Sweat** is primarily made up of water, but it also contains **electrolytes** that have essential roles in the body. **Sodium** and **chloride** are the most abundant electrolytes in sweat with **potassium**, **magnesium**, and **calcium** present in lower amounts.

**Athlete Example:** A runner who loses 3 liters of fluid in 1 hour is losing 1,380-5,520mg of salt.

## Sweat Composition

Mineral	mg/L
Sodium	460-1840
Chloride	710-2840
Potassium	160-390
Magnesium	0-36
Calcium	0-120



Sodium, chloride, and potassium work together to help regulate and maintain fluid balance.

Magnesium and calcium are essential for optimal muscle function and play an important role in energy metabolism.

- Losing as little as 2% of your body weight during a workout can result in decreased aerobic performance.
  - For a 200lb athlete, that is 4lbs of sweat lost during a workout.
- Water and electrolytes should be consumed throughout the day to maintain adequate fluid levels as well as optimal electrolyte levels.
  - Electrolyte replacement is most important during high-intensity training lasting >1 hours.
- Remember to properly hydrate before, during, and after exercise as well.

ELECTROLYTES ARE FOUND IN SPORTS DRINKS AND ELECTROLYTE PACKETS/TABS. THEY ARE ALSO FOUND IN FOOD.



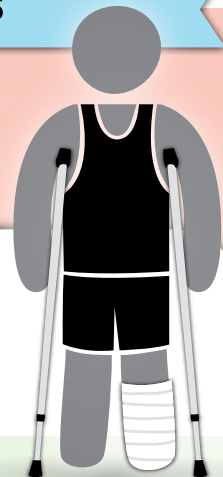
- **Sodium-rich foods:** salted nuts/trail mix, pretzels, crackers and table salt.
- **Foods high in potassium:** bananas, potatoes, dark leafy greens, and citrus fruits.
- **Foods high in magnesium:** pumpkin seeds, almonds, cashews, peanut butter, spinach, and beans.
- **Foods high in calcium:** milk, yogurt, almonds, and broccoli.



# NUTRITIONAL SUPPORT FOR INJURY RECOVERY AND RETURN-TO-PLAY

by Ryan Harmon, MS, RD, CSSD and Andres Ayesta, MS, RD, LD, CSCS

Injuries are an inevitable part of sports participation. Nutrition may not be able to keep an athlete completely injury-free, but it can support and often speed up injury recovery. Poor nutrition will impair recovery and lengthen the time it takes an athlete to return to play.

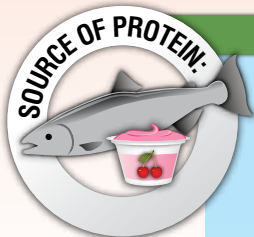


Nutrition intervention by the sports dietitian should occur immediately following an injury. The athlete should be screened for nutrient deficiencies, energy balance, lipid balance, optimal hydration and sleep habits. The nutrition plan should be tailored to an individual's phase of injury, resting metabolic rate (RMR), physical activity level and desire to minimize any gains in fat mass.

## GOALS OF NUTRITION INTERVENTION:

- Support muscle protein synthesis.
- Preserve muscle mass.
- Maintain energy balance.
- Prevent body fat accrual.

## NUTRITIONAL CONSIDERATIONS:



### PROTEIN

- Helps athletes heal and repair muscle tissue.
- Should emphasize proteins with a high leucine content (aim for ~3g leucine per serving).
- Daily protein intake should be between 1.6-2.5g/kg BW/day (depending on phase of injury).
- **Protein specifics:**
  - **Meal dose** = 20-40g (depending upon leucine content).
  - **Frequency** = every ~3-4h (4-6 meals daily).
  - **Type** = quickly digested, high leucine content during the day (whey protein, part-skim cheddar cheese and lean meats are great sources); slowly digested proteins prior to sleep (i.e. low-fat cottage cheese, low-fat Greek yogurt).



### CARBOHYDRATE (NEEDS UNIQUE TO EACH SCENARIO)

- Used for fuel so the protein eaten can be used to heal and repair muscle tissue.
- Needs are typically lower to prevent excess weight gain\*.
- Should include whole grains, fresh fruits and vegetables.
- **Carbohydrate recommendations** should be 3-5g/kg BW/day.
  - For a 170lb male = 232-386g/day (typical 4oz whole-wheat bagel = 60 grams).
  - Choose low glycemic index foods (i.e. whole grains).

\*The athlete should understand that some weight gain may be preferable to support a full recovery.



### FAT (NEEDS UNIQUE TO EACH SCENARIO)

- Essential for healing, recovery and decreasing inflammation.
- Should come from anti-inflammatory nuts and nut butters, seeds, avocado, oily fish, flaxseed oil, extra virgin olive oil and omega-3 fish oil.
- Pro-inflammatory omega-6 vegetable oils, saturated and trans fats should be limited.
- Omega-6/omega-3 ratio should be low to enhance anti-inflammation.



# NUTRITIONAL SUPPORT FOR INJURY RECOVERY AND RETURN-TO-PLAY

MICRONUTRIENTS	SOURCES	FUNCTION
<b>Vitamin C</b>	Citrus fruit, red and green peppers, cantaloupe	Antioxidant, wound healing, tissue repair, immune function
<b>Vitamin A</b>	Sweet potato, spinach, carrots, tomatoes	Cell growth and development, immune function
<b>Vitamin D</b>	Sun exposure, oily fish, dairy products, fortified foods	Promotes calcium absorption and bone health
<b>Calcium</b>	Low-fat milk, fortified non-dairy milk, low-fat Greek yogurt, cheese, broccoli, kale, fortified orange juice	Supports skeletal structure and function
<b>Magnesium</b>	Almonds, sesame and sunflower seeds, cashews, peanuts, bananas	Nucleic acid and protein synthesis, improves absorption and metabolism of calcium and vitamin D, improves circulation
<b>Zinc</b>	Lean beef, crabmeat, chicken, cashews, fortified cereals	Wound healing, protein synthesis, immune function
<b>Copper</b>	Sesame, pumpkin and sunflower seeds, cashews, shiitake mushrooms	Assists with red blood cell (RBC) formation, immune function and bone health, regenerates elastin

## RESEARCH-BASED SUPPLEMENTS & NUTRITIONAL CONSIDERATIONS (0-8 WEEKS):

Ultimately, a nutrition plan that includes a well-balanced diet from a variety of whole foods is best for a healing athlete. Supplements may be beneficial to an athlete's nutrition plan in addition to meals and snacks. Athletes should meet with a sports dietitian to see how supplements can safely fit into their nutrition plan.

### FOODS THAT MAY SPEED RECOVERY FROM INJURY:

- **High quality omega-3 fatty acids:** found in cold-water fish such as salmon and tuna.
- **Branched chain amino acids (BCAAs):** 3g of leucine every 3-4 hours (found in 25-30g whey protein powder, 140g chicken or 170g fish).
- **Casein:** 20-25g prior to bed (casein protein powder, 1 cup of low-fat cottage cheese or 1½ cups Greek Yogurt).
- **Tart cherry juice:** 12oz - 24oz per day for anti-inflammatory and antioxidant support.
- **Gelatin or gelatin-based foods:** may support collagen synthesis.



### RESEARCH-BASED SUPPLEMENTS THAT MAY SPEED RECOVERY FROM INJURY:

- **Creatine monohydrate:** 10 g/day for 2 weeks, then 5 g/day (conditionally appropriate – unique to each scenario).
- **β-hydroxy-β-methylbutyrate (HMB):** leucine metabolite shown to provide anabolic and anti-catabolic properties on lean body mass – 3g/day (HMB calcium or free acid form).
- **Fish oil supplements:** 3-4g/day DHA + EPA recommended.

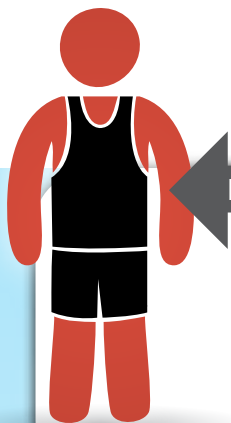


**Athletes should maintain a nutritious diet on a daily basis to maximize nutrient stores rather than ramping up their nutrition once an injury occurs.**



# BALANCING EXERCISE-INDUCED INFLAMMATION

by Laurel M. Wentz, PhD, RD, CSSD



EXERCISE-INDUCED INFLAMMATION IS THE BODY'S RESPONSE TO INJURY DUE TO INTENSE PHYSICAL ACTIVITY

- The immune system response causes redness, swelling, pain.
- Acute inflammation is a normal response to high-intensity exercise, but prolonged (chronic) inflammation is a sustained response that affects the entire body.
- Prolonged Inflammation:
  1. Causes fatigue, muscle damage and soreness.
  2. Limits muscle growth and training progression and increases muscle loss.
  3. Modulating prolonged inflammation may enhance recovery & reduce soreness.

## ROLE OF NUTRITION IN REDUCING INFLAMMATION:

### CONSUME FLUIDS DURING EXERCISE



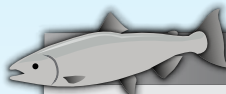
- Consume fluids and electrolytes to prevent dehydration and maintain saliva, which contains anti-microbial properties.

### MEET PROTEIN REQUIREMENTS



- Supports immune cell synthesis & reduces exercise-induced muscle damage.
- Consume **20-30 grams** of high-quality protein post-exercise (depending on body weight).

### INCREASE OMEGA-3 FATTY ACIDS



- Essential fats which support brain health & reduce inflammation.
- Mickleborough et al showed Creatine Kinase (a marker of muscle damage) decreased with omega-3 marine oil compared to a placebo.
- **High omega-3 foods:** salmon, tuna, mackerel, herring, walnuts, flaxseed, chia seeds.
- Aim for 1-3 grams/day.

### SELECT HIGH-ANTIOXIDANT FOODS



- Consuming fruits/veggies vs. excess antioxidant supplements (which have been shown to inhibit muscle recovery and impair training adaptations) will dampen the oxidative stress caused by exhaustive exercise.
- **Foods high in vitamins C, E, and A:** dark leafy greens, nuts/seeds, avocado, broccoli, peppers, berries, citrus, tomatoes, carrots, sweet potatoes/squash.

### TRY TART CHERRY JUICE



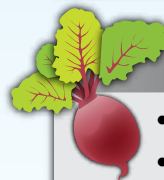
- Shown to maintain muscle strength and reduce muscle pain by reducing inflammation and oxidative stress.
- High in **anthocyanins**—antioxidant found in purple and red produce.

### OPTIMIZE VITAMIN D



- Made by the body in response to sunlight, and regulates inflammatory response.
- Many athletes are deficient due to low sun exposure during peak hours (10am-2pm), and the difficulty of getting enough through food.
- **High vitamin D foods:** Fatty fish, egg yolks, fortified dairy products.
- **Typical needs:** 2000-5000 IU vitamin D per day, depending on diet and outdoor activity.

### EXPERIMENT WITH NITRIC OXIDE & NITRATES



- Nitrates convert to nitric oxide (NO) in the body.
- **Nitric oxide:** Increases blood flow, which may reduce inflammation & enhance recovery.
- **High nitrate foods:** celery, leafy greens, beets.

### SEASON WITH HERBS & SPICES



- Contain various antioxidants, minerals, vitamins.
- **Best choices:** ginger, turmeric (curry), garlic, cinnamon, rosemary.



# FUELING ON-THE-GO

by Kristina LaRue, RD, CSSD, LDN

With a little planning, athletes can be prepared for eating while traveling or between classes and workouts. Stock your gym bag and dorm with these on-the-go fueling essentials.

## TRAVEL NUTRITION ESSENTIALS:

- **Hydration is important!** For plane travel, one loses 3-10oz/hr. Drink at least 8oz/hour.
  - Carry a **water bottle** + don't forget electrolytes!
- **Pack snacks** in your carry-on or book bag (Include salty snacks.)
- Bring **non-food activities/schoolwork** to prevent eating out of boredom.
- Carry an **eye mask & earplugs** to support healthy sleep habits.
- Don't forget any **supplements** you take regularly!
- **Consume probiotic-rich foods** to ensure optimal gut health—stress & travel can cause GI issues – both constipation and diarrhea.

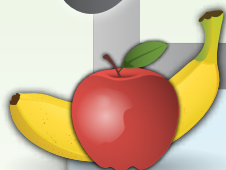


## EASY SNACK IDEAS:



### QUICK-DIGESTING CARBS (EAT < 1 HOUR BEFORE WORKOUT)

- Applesauce or applesauce/fruit puree pouches.
- Canned fruit in own juice.
- Fruit Smoothies—frozen fruit, OJ, spinach.
- Pretzels.
- Sports drinks, gels, energy chews.



### SLOW FUEL - WHOLE GRAIN CARBS & HEALTHY FATS

Eat throughout the day for sustained energy

- Fruit and nut bars.
- Trail mix—dried fruit, nuts, whole grain cereal.
- Whole grain crackers and hummus cups.
- Granola/cereal in baggies.
- Pre-popped, low-fat popcorn.
- PB&J—whole grain bread, peanut butter, and jelly.
- Corn chips and guacamole or salsa.
- Instant oatmeal/cream of wheat.
- Fresh Fruit—apples, bananas, clementines, and grapes travel well.
- Baby carrots or other cut veggies.



### PERFORMANCE PROTEINS

Optimal for mid-day snack and refueling post-workout

- Beef jerky.
- Hard-boiled eggs.
- String cheese.
- Greek yogurt.
- Deli turkey, chicken, or ham for simple deli sandwiches.
- Dry-roasted edamame.
- Tuna/chicken pouches.
- Protein powder—NSF certified.
- Single-serve peanut butter packets (protein & fat source).
- Shelf-stable chocolate milk/protein shakes.



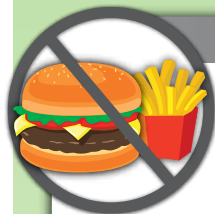


# DIETARY SUPPLEMENTS: THE GOOD, THE BAD, AND THE UGLY

by Tavis Piattoly, MS, RD, LDN

The dietary supplement industry is an ever-growing market and currently offers over 50,000 products including vitamins, minerals, herbal supplements, weight-loss products, protein powders and shakes, and pre-workout boosters. With so many options, it's understandable that an athlete may become confused about which brand to trust, what dosage is appropriate, and what product is safe to take.

## THE PROBLEM



- Poor dietary choices and meal frequency are the limiting factors in why most athletes do not achieve their performance goals.
- You can't out-supplement a bad diet—many athletes think if they can take a pill or a powder, they don't need to eat the real stuff.
- More is not better—using more than the recommended dosage will not provide greater gains but can lead to serious consequences (i.e. banned from competition (college and pro), negative side effects on health (increased blood pressure), irregular heart rate, enlarged organs (from steroid use), liver failure).
- Athletes run the risk of using a supplement that may contain a banned substance if purchasing from a supplement store or relying on the advice from someone not familiar with 3rd party testing certification and its process.

## THE FOOD FIRST SOLUTION



- Eat a meal or snack every 3 to 4 hours to stay well-fueled and to keep blood sugar stable for optimal energy (i.e. PB and honey sandwich, fruit and nuts, lean protein with fruit and veggies, turkey sandwich with fruit and salad).
- Pre-workout snack or breakfast every morning to minimize utilization of muscle tissue for energy, especially if the athlete has an early lifting or practice session.
- **Implement your plan:** make a bunch of sandwiches on an off-day, portion out your snacks ahead of schedule (i.e. trail mix, fruit and nuts, nutrition bars, PB&J sandwiches), and meal prep for the week to avoid skipping meals.

**With the amount of dietary supplements on the market, how can athletes make the right and safe choice when it comes to purchasing dietary supplements?**

## HOW TO EVALUATE A DIETARY SUPPLEMENT FOR SAFE AND EFFECTIVE INGREDIENTS

	Good	Bad	Ugly
Lists individual ingredients on label	✓		
Dosages based on scientific research	✓		
Tested for banned substances	✓		
Uses branded ingredients/raw materials	✓		
Manufactured in an NSF facility that carries both the cGMP and Athletic Banned Substances certifications	✓		
Uses generic ingredients		✓	✓
Uses a proprietary blend		✓	✓
Uses stimulants to cover up for insufficient ingredient profile (i.e. pre-workout supplements)		✓	✓
Contains banned substances			✓



# SAFE SUPPLEMENTS: PROS & CONS

\* Disclaimer: All individuals respond differently to supplements. Please talk with your Sports Dietitian before taking any supplements, and remember that the brand matters. Make sure it's a reputable, tested brand, and one that the Sports Dietitian recommends/stands behind.

Dietary Ingredient	Potential Benefits	Potential Risks/Side Effects
Beta-Alanine	May buffer muscle acid by increasing muscle carnosine levels, enhancing muscular endurance. Best for training or events lasting 60-240 seconds.	Parathesia (i.e. tingling of skin) if taken in higher dosages. Side effects may vary depending on weight of individual and dosage taken.
Beetroot	Increases nitrates and may improve aerobic endurance performance.	Heavy consumption may lead to beeturia (red or pinkish urine or stools) and kidney stones due to the high oxalate content. Take caution with choosing the best brand, as some may be of low quality and content.
HMB (Free Acid)	May increase lean muscle and strength when combined with resistance training in untrained individuals. May provide anit-catabolic effects, preventing muscle wasting + supporting healing.	No known side effects or toxicity reported in dosages up to 6 grams per day in human studies.
Creatine monohydrate	May increase lean mass, strength, sprint performance, anaerobic power.	Larger doses (> 20g per day for 5 days) may lead to diarrhea or nausea in some individuals and many anecdotal reports of cramping.
Omega-3 fatty acids (i.e. Triglyceride-based fish oil) (50% of the omega-3/fish oil should come from EPA & DHA fats)	May reduce inflammation, muscle soreness, body composition, exercise-induced asthma, joint soreness, and enhance brain health.	If taken in dosages higher than 5-6 grams per day, may increase risk of bleeding, hypoglycemia, low blood pressure, loose stools, nausea, fishy breath. Many brands are low quality and don't provide enough EPA & DHA.
Probiotics	May filter out and eliminate harmful bacteria, toxins, chemicals, and waste products in our digestive tract. May be beneficial for athletes with IBS, abdominal pain, diarrhea, antibiotic-related diarrhea, bloating, and ulcerative colitis. May improve immune health.	Children, pregnant women, and individuals with compromised immune systems should speak with their physician before taking a probiotic supplement. May cause gas, bloating, diarrhea, and stomach pains during the first few days of use.
Sodium bicarbonate (i.e. Baking Soda)	Delay muscular fatigue by reducing the increase in lactic acid associated with exercise. May improve anaerobic and peak power.	Individual differences in side effects, but GI distress very common, including diarrhea and stomach pain.
Caffeine	May improve endurance & high-intensity exercise >20 min, stimulate central nervous system.	**Caffeine is a controlled/restricted substance, so athletes should refrain from using synthetic forms and pay attention to amount in naturally-occurring products. Risk of jitters, nausea, rapid heart rate, anxiety, poor sleep etc. from overdosing; possible diuretic effect if not well-hydrated over long-term.
Vitamin D	May reduce fat mass and increase lean mass; supports immune health, bone health, and may reduce inflammation.	Megadoses of vitamin D (50,000 IU a day for several months) may lead to toxicity in the blood, which leads to hypercalcemia, poor appetite, nausea, vomiting, and kidney problems.

## Ingredients found in muscle building supplements with little to no research supporting their use:

- Arginine.
- L-Arginine AKG.
- Agmatine Sulfate.
- BCAA's.
- Citrulline Malate.
- D-Aspartic Acid.
- Glutamine.
- L-Carnitine.
- Kre-Alkayn.
- Creatine Ethyl Ester.
- Di-Creatine Malate.
- Creatine Hydrochloride.
- Creatine Magnesium.

## Stimulants found in pre-workout & weight loss supplements:

- Caffeine.
- Guarana Seed.
- Hoodia Gordonii.
- Caffeine Anhydrous.
- BMPEA.
- Kola Nut.
- Green Tea Extract.
- Yohimbine.
- Dendrobium.
- Synephrine.
- DMAA (1-3 Dimethylamylamine).
- Yerba Mate.

The following logos are placed on supplements to indicate the product has passed 3rd party testing certification and may be free of banned substances:

\*It is important to discuss your supplements with your Sports Dietitian. Even with these certifications, some companies may still produce other products that contain banned substances. \*\*Each 3rd party testing company varies in what they test for and the method in which they test.



www.nsf-sport.com | www.informed-choice.org



List of Banned Substances for NCAA, Professional, and Olympic Athletics:

<http://www.ncaa.org/health-and-safety/policy/2014-15-ncaa-banned-drugs> | <https://www.wada-ama.org/en/what-we-do/prohibited-list>



# WASTED WORKOUTS

by Kristina LaRue, RD, CSSD, LDN

Athletes and non-athletes alike consume alcohol as a means to celebrate, relax, relieve stress or reduce inhibitions. When an athlete chooses to consume alcohol, as little as one drink can have a deleterious effect on their performance.

## HOW DOES ALCOHOL IMPACT THE BODY?

### SHORT-TERM EFFECTS

- **Hydration**—alcohol is a diuretic that can lead to dehydration.
  - Rehydration from one alcoholic drink requires consumption of twice as much water.
- **Motor skills**—slower reaction time, decreased hand-eye coordination and impaired balance.
- **Strength**—decreased grip strength, jump height and speed.

- **Aerobic performance**—faster fatigue, increased ventilatory stress and decreased lactate threshold.
- **Sleep**—disrupted REM sleep= hormonal suppression = impaired muscle synthesis and performance.



### LONG-TERM EFFECTS

- **Weight gain**—alcohol has low nutritional value with one drink containing an average of 100-150 empty calories.
  - The body will store alcohol as fat by converting alcohol sugars into fatty acids.
- **Nutritional deficiencies**—decreases vitamin and mineral absorption, utilization and excretion (e.g. thiamin (vitamin B-1), vitamin B-12, folic acid and zinc).

- **Disease**—long-term, heavy drinking increases the risk of cardiovascular disease, anemia, liver damage, depression and dementia.
- **Illness and injury**—depresses immune function and contributes to delayed healing.
  - Injury rate for drinkers = 54.8% vs. non-drinkers = 23.5%

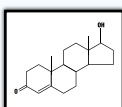
## OTHER PHYSIOLOGICAL EFFECTS:



**Cancels out muscle gains**—decreases testosterone and growth hormone, and enzymes important in supporting muscle growth.



**Depletes energy sources**—affects the ability to produce fuel for muscle contraction, resulting in loss of energy and poor endurance.



#### Hormones:

- Increases glucocorticoids (most notably cortisol) - stress hormones that influence metabolism and development.
- Decreases human growth hormone (HGH) and testosterone—critical to muscle development and repair.

A healthy body is critical to achieving optimal performance for all athletes—it's important for the athlete to consider these consequences and how it will affect future training sessions, games and competition.



# THE SCIENCE OF HYDRATION

by Stacy Sims, PhD, CISSN

Hydration is a complex topic, with even more complex physiology. In this carb-centric society, the emphasis in sports nutrition has been on carbohydrate availability in fluid form, but this neglects the true meaning of “Hydration”.

hy·dra·tion (hī-drā'shən) - n.

1. The addition of water to a chemical molecule without hydrolysis.
2. The process of providing an adequate amount of liquid to bodily tissues.

**Optimal hydration requires a balance of both fluids and electrolytes.**

## HYDRATION BENEFITS

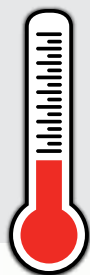
- ✓ Moistens tissues in eyes, nose, mouth.
- ✓ Assists the body in thermoregulation via sweat.
- ✓ Provides lubrication to the joints.
- ✓ Is the medium for transportation (of nutrients, oxygen, waste products) of the blood and across cells.
- ✓ Muscles are 75% water.

## POSSIBLE INDICATORS OF UNDER-HYDRATION:

- Headache post-training, with high sweat rate or low fluid intake pre and during training - hypohydration.
  - \*Headaches post-training with **high water intake** during long training sessions may be an indication of **exercise associated hyponatraemia (EAH)**.

Possible Causes of Under-Hydration:

- High volume of sweat, intense workouts, long workouts.
- Heavy workouts in cold weather with multiple layers.
- Hot & humid conditions.



- Heat intolerance during exercise-hypohydration.

- Decreased endurance performance.



- Dizziness/light-headedness.
- Fatigue.
- Moodiness/irritability.
- Thirsty = drink.

- Poor appetite and elevated metabolism >1 hour post exercise = dehydration.
- Nausea.
- Cramps – \*May also be caused by neuromuscular issues and/or electrolyte depletion – research still equivocal on one specific cause.

- Dark, low volume of urine = dehydration.

\*Exercise associated hyponatraemia - low sodium in the blood



# THE SCIENCE OF HYDRATION

## DRINK TO THIRST OR ON A SCHEDULE?

### DRINK TO THIRST DURING EXERCISE IF:

- The athlete has pre-hydrated, otherwise can be susceptible to injury (e.g. rhabdomyolysis, poor recovery, decreased motivation).
- The athlete is heat acclimated (for hot training and games/racing/events).
- The athlete is trained.
  - After significant time off with lower fitness levels, hypohydration and exercise stress can exacerbate thermal strain and decrease performance metrics.
- If the athlete is a woman in the luteal phase of her menstrual cycle or on the progesterin-only mini-pill (high estrogen and progesterone decrease plasma volume and lower plasma osmolality, predisposing a woman to hyponatremia).
- If the athlete has a history of EAH or has Syndrome of Inappropriate Antidiuretic Hormone secretion (SIADH).

### DRINK ON A SCHEDULE (NOT TO EXCEED 800ML/H IN A TEMPERATE ENVIRONMENT- SMALLER INDIVIDUALS NEED LESS, LARGER NEED MORE; IN THE HEAT, MORE FLUID WITH SODIUM MAY BE NEEDED) IF THE ATHLETE:

- Is a junior athlete (e.g. has not gone through puberty).
- Has 2+ heavy training sessions/day (to avoid systemic dehydration).
- Is unacclimated and training at altitude.
- Has a history of heat illness.
- Is drinking plain water.
- Is hypohydrated, traveling, has low glycogen, or in a hot/humid environment.



## HOW TO ASSESS HYDRATION?

### In the Morning:

- Use **WUT**– Possible dehydration if 2 or more below markers are present:
  - **Weight** – Ensure maintaining stable body weight day-to-day within 1%.
  - **Urine** – Darkened first morning urine or reduced daily frequency.
  - **Thirst** – Dry mouth or the craving of fluids.

### Multiple Practices in a Day or <24 Hours Between Practices:

- Pay attention to urine color and drinking something with salt and/or salted watery fruits or veggies.
- Pre/post-weight – check to assess fluid loss.
  - Ensure not just drinking plain water but added sodium.

### PRE Training:

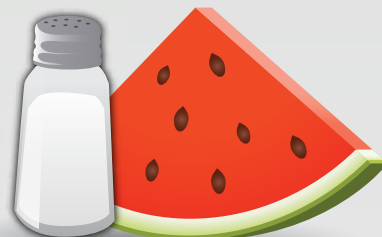
- Salted watery fruits and vegetables (e.g. salted tomatoes, apples, watermelon).
- Water with a dash of salt (1/16th tsp table salt per 20oz water).
- Use a specific hyperhydration beverage or high sodium broth/soup.

### DURING Training:

- Drink appropriately (i.e. to thirst or on a schedule if the athlete meets the scheduling criteria) a beverage that contains per 8 fluid ounces: Sugars (from glucose and sucrose): 7 – 9.5 grams (3-6% carbohydrate solution); Sodium: 150-180mg; Potassium: 60-75mg.

### POST Training/Acute Rehydration:

- Urine should be clear 2-3 hours post-training.
- Protein+carbohydrate-based recovery drink/smoothie.
- Low-carbohydrate electrolyte drink.
- Soups.
- Salted watery fruits/veggies (salted tomatoes, salted [water]melons).





# SERIOUS HYDRATION FOR SERIOUS ATHLETES

## WHAT IT IS:

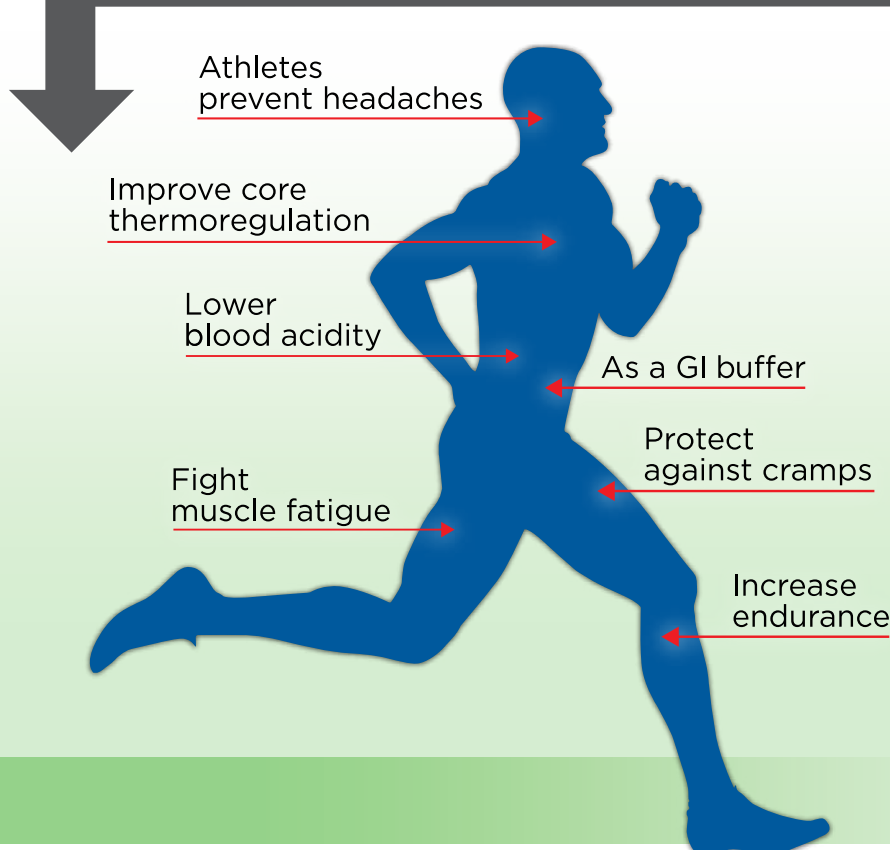
**The Right Stuff®** is an electrolyte, liquid- concentrate, drink additive from NASA for those who work and compete hard and sweat a lot. It contains no sugar, carbohydrates, stimulants, added colors, artificial flavors, gluten, dairy, nuts, meat or shellfish.

**The Right Stuff®** was developed for our Astronauts because they suffer from severe dehydration when they come back into the gravity of Earth. NASA spent over a decade conducting numerous studies to create the optimal formula.

Compared to all of the other NASA-tested formulas, **The Right Stuff®** is shown to be the most effective hydration formula for use by astronauts and people here on Earth.



## PROPER HYDRATION WITH THE RIGHT STUFF® HELPS:



## HOW IT'S BETTER

Based on numerous published studies, **The Right Stuff®** is far superior for:

1. Combating the symptoms (cramps, headaches, muscle fatigue, light-headedness etc.) caused by heavy sweating, dehydration and electrolyte loss.
2. Improving core thermoregulation; helping protect the body from overheating in high heat settings and in times of intense exertion.
3. Increasing endurance by over 20% more than any other NASA tested formula.

## HOW IT WORKS:

The NASA-developed blend of electrolytes goes more rapidly into your bloodstream than any other NASA-tested formula. It protects you more quickly from dehydration symptoms AND it protects you longer!



**One key ingredient in the formula is Sodium Citrate which does two things:**

1. It acts as a GI buffer so you do not suffer from distress that many sports drinks can cause, especially in the heat.
2. When it is absorbed into the bloodstream it is used by the liver in the glycogen-conversion process. As a byproduct, it lowers the acidity of the blood.

NASA studies show that **The Right Stuff**® is also a potent aid for fighting the negative effects of jet lag and high altitudes. Plus, while NASA didn't test it for this, we frequently hear that it is also a great hangover preventer when consumed right before bed at the end of the night of partying.



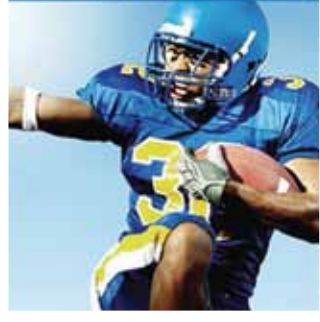
## HOW TO USE:



**The Right Stuff**® fights the symptoms of dehydration before, during and after exertion. For optimal performance, it is best to mix with water. However, many add it to their sports drink to add carbohydrates to what they are consuming.

Drink a bottle of water (at least 16 fl oz/500mL) with the contents from a pouch of **The Right Stuff**® prior to starting your activity (don't slam it). It can also be used throughout the training and competition as needed.

## WHO ITS FOR:



1. Many pro teams (MLB, NBA, NFL, NHL, MLS, etc.) and Olympians like 2x medal-winning sprinter Walter Dix all have integrated **The Right Stuff®** into training and competition.
2. Endurance athletes including Cyclists, Runners, Triathletes, Adventure and Obstacle Racers (e.g., Tough Mudder, Warrior Dash etc.).
3. Universities across the US including schools from ACC, B1G, Big 12, Big East, Colonial, C-USA, ECAC, Ivy, MAAC, MAC, Mountain West, Pac 12, SEC and Southern among other conferences.
4. First responders including military personnel, firefighters, SWAT etc.
5. Industrial workers including construction, paving, roofers, warehouse workers and parcel delivery.

**The Right Stuff®** is most valuable for athletes who work out and compete in high heat or at high levels of intensity. Athletes that participate for long durations (e.g., cyclists, golfers) or at high intensity (e.g., CrossFit, basketball) will notice the benefits the most. It is especially valuable for heavy/salty sweaters, people susceptible to the negative effects of dehydration, athletes trying to increase their endurance and those wanting to recover faster.







# MACRONUTRIENT FOUNDATIONS

by Lisa Chan, MS, RD, CSSD, LD

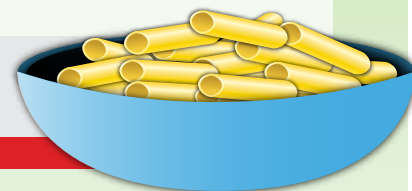
## Carbohydrates are FUEL



- Carbohydrates are the main source of energy for an athlete's body & brain.
- Carbohydrates help athletes maintain intensity, prevent muscle breakdown, and assist in maintaining hydration.
- Some carbohydrates provide a quick source of fuel (white bread/rice/pasta, pretzels, sports drinks, applesauce).
- Other carbohydrates fill your fuel stores for later use (oats, whole grain bread/rice/pasta, low-fat granola).

• When carbohydrate intake is too low, energy levels, strength, stamina, and decision-making may suffer during workouts. This may lead to poor performance and increased injury risk.

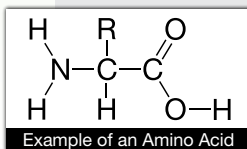
• As an athlete, consuming adequate carbohydrates at appropriate times can make a big difference in training, performance, and overall athletic success.



## Protein is STRUCTURE

• Protein plays a big role in keeping the body functioning properly, and a healthy, nourished body is one that can perform at the highest levels.

• In our bodies, protein makes up tissues (including muscle), enzymes (which help facilitate reactions in the body, e.g., metabolism of food into usable energy), hormones (your body's messengers), antibodies (for proper immune function), and much more.



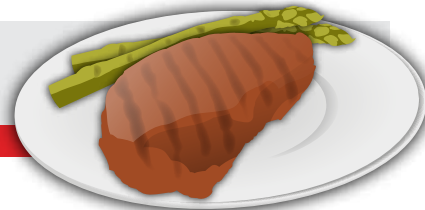
- Proteins are made up of building blocks called **amino acids**.
  - There are 20 amino acids; 9 are essential, meaning you need to get them from your diet.
  - Essential amino acids are critical in athletic recovery and muscle building.

• Protein is most effectively used when spread throughout the day, rather than in 1 or 2 large meals.

- Give your body 4-5 separate doses of protein throughout the day. Have a source of protein (meat, poultry, seafood, dairy, eggs, tofu, nuts, etc.) with every meal or snack.

• Post-exercise is an important time for protein. **Recovery nutrition** is important within 45-60 minutes after a workout, but also throughout the next 24-48 hours.

• Protein takes a bit longer than carbohydrates to digest and can help one feel full longer, which may assist in weight loss.





# MACRONUTRIENT FOUNDATIONS

## Fat is ESSENTIAL

- Fat is an essential component for athletes striving for a quality performance diet.
- **The many functions of fat:** maintain body temperature, support immune function, cushion and protect organs, facilitate nerve transmission, assist in vitamin absorption, and provide a source of energy for long-term, low intensity aerobic activities.

### TYPES OF FATS:

- **Unsaturated fats**—found in foods like olive/canola/peanut oils, nuts, avocados, fatty fish, eggs, seeds.
  - May help keep cholesterol and blood pressure low.
  - Omega-3 fatty acids—unsaturated fats linked to reducing inflammation and supporting brain health (and potentially decreasing concussion risk and/or symptoms).
- **Saturated fats**—found in foods such as dairy foods, fatty cuts of meat, chicken skin, margarine, deep fried fast foods, commercially baked pastries/pies, biscuits.
  - Increased intake of saturated fats may contribute to: elevated cholesterol, risk of heart disease/stroke, and inflammation in the body.



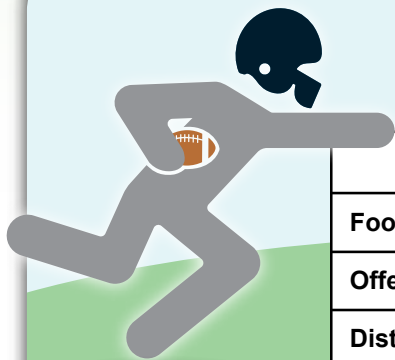
## CHOOSE UNSATURATED FATS MORE OFTEN THAN SATURATED FATS

When fitting foods into your performance diet, remember:

- Too little fat may contribute to low energy levels during aerobic exercise, compromised immune function, inconsistent menstrual cycles in women, and inefficient digestion of certain nutrients.
- Too much fat can contribute to inadequate intakes of the other macronutrients, undesirable weight gain, and health issues such as heart disease.

### SPORT-SPECIFIC MACRONUTRIENT NEEDS

Macronutrient needs vary depending on the sport, position, season of competition, and intensity and length of exercise, as well as the athlete's height, weight, sex, age, and body composition goals. Below are some examples of how macronutrient needs differ between sports:



	CHO	PRO	FAT
<b>Football Wideout</b>	6-10g/kg BW	1.4-2.0g/kg BW	Balance to meet remaining energy needs after CHO + protein needs are met
<b>Offensive Lineman</b>	4-8g/kg BW	1.4-2.0g/kg BW	Balance to meet remaining energy needs after CHO + protein needs are met
<b>Distance Runner</b>	6-12g/kg BW	1.2-2.0g/kg BW	Balance to meet remaining energy needs after CHO + protein needs are met
<b>Wrestler</b>	5-8g/kg BW	1.2-2.0g/kg BW	Balance to meet remaining energy needs after CHO + protein needs are met

*Note: Football players' needs will vary depending on the season – training camp, in-season, off-season. Distance runners' needs will vary during a taper, heavy training or shorter vs longer distances. Wrestlers' needs will vary depending on where they are in their season, how far above their weight class they are, and how close they are to the minimal allowed body fat before certifications.*

Reference:

1. Stuart M. Phillips & Luc J.C. Van Loon (2011) Dietary protein for athletes: From requirements to optimum adaptation, *Journal of Sports Sciences*, 29:sup1, S29-S38



# PERIODIZATION AND TIMING OF MACRONUTRIENTS

by Clint Wattenberg, MS, RD, CSCS

Nutritional Timing is critical in optimizing an athlete's training, performance and recovery. Strategic "Carbohydrate Matching" maximizes the benefits of performance fueling by providing optimal macronutrients at the ideal time; this promotes energy availability to enable "Perpetual Anabolism".

## PERPETUAL ANABOLISM:

Providing the body nutrients to rebuild lean tissue facilitates a state of constant/continual repair of muscle, organs, connective tissue, bone, immune system, hormones and glycogen.



## FUNDAMENTALS OF PERPETUAL ANABOLISM:

**1. Energy on demand:** Providing energy **substrate** (from food) to an athlete **while exercising** allows the substrate to be used as the fuel source, preserving the body's energy **stores** - "Carbohydrate Matching" provides optimal fuel to an athlete just before and after it is needed by the body.

- **Energy stores** include muscle glycogen, muscle protein and body fat and can be broken down for energy when substrate is not available for utilization.
  - **Glycogen** - the body's storage form of carbohydrate and is the most efficient form of stored energy for an exercising body.

**1. Glycogen storage** - Increasing stores improves tissue repair and energy recovery, while low glycogen replenishment increases fatigue and injury risk.

- **Include 30-60g carbs 30-60 min pre-workout (see below).**
  - A combination of carbohydrate types may be appropriate.
    - **Complex:** high-fiber foods (i.e. whole grains).
    - **Simple:** low-fiber foods (i.e. sports drinks, dried fruit).



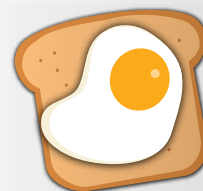
## 2. Targeted Protein Intake

### • Optimal Protein Fueling

- Moderate quantities (20-30g) of high-quality protein should be consumed every 3 hours when awake to stimulate tissue repair.
- Aim for 3-5 separate doses of high-quality protein.

### • Fueling Around Sleep – Before and After:

- 25-40g protein within 1 hour of bed stimulates tissue repair (anabolic) rather than degrading (catabolic) while sleeping.
- Including both protein for tissue repair and carbs for energy substrate to start your day "breaks" the overnight "fast" (i.e. breakfast) and drives the body to an anabolic state.



## 3. Exercise Recovery

- Stimulate an optimal anabolic response to training.
- Add 20-30g protein consumed with 40-80g of carbs within 30-45 minutes of exercise completion.



# PERIODIZATION AND TIMING OF MACRONUTRIENTS

## CARBOHYDRATE MATCHING:

Athletes require energy substrate to fire the muscles, and carbohydrate is the substrate the body burns best. Providing carbs on demand before and during exercise, and to stimulate recovery, can both optimize training and mitigate any energy deficit created through training.

### CARBOHYDRATE MATCHING RECOMMENDATIONS:

#### 1 Pre-Workout

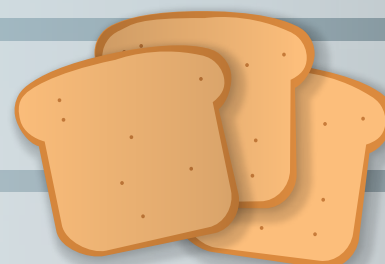
30-60g (blend of complexity as tolerable) carbs 30-60 min pre-workout

#### 2 Mid-Workout

- <45 mins = not necessary.
- 45-75 mins = sports drink or sport food as tolerated.
- Endurance training 90 – 150 mins = 30-60g per hour.

#### 3 Post-Workout

(Anaerobic) 40g <---> 80g (Aerobic)



### CASE EXAMPLE:

#### A 150lb college student-athlete:

- **Nutritional goals:** Optimizing physical and mental energy, maximizing in-season strength and minimizing injury risk.
  - Body weight and composition should not be of primary concern for this **in-season** athlete so maintain focus on **perpetual anabolism** and **carb matching**.

**In-season practice schedule:** 8am lift, 3pm hard team practice with conditioning.

#### Male:

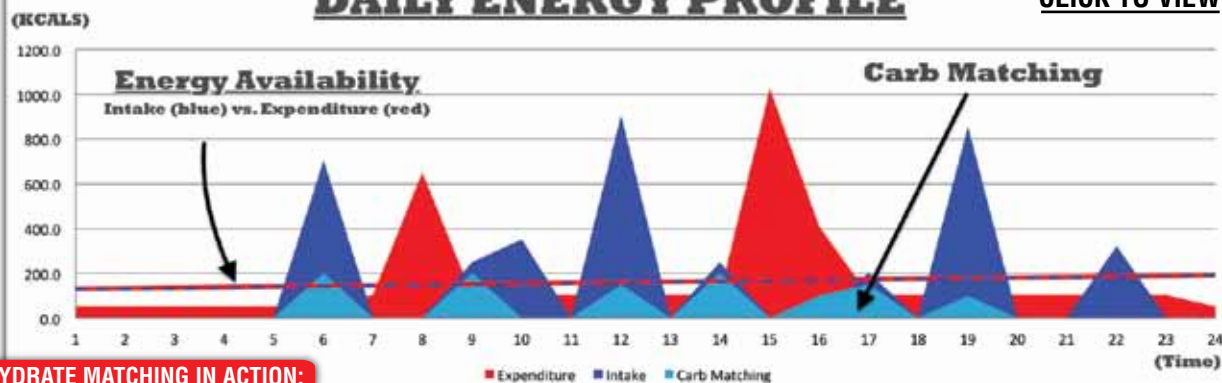
Estimated baseline energy expenditure = 2030 kcals  
Estimated exercise energy expenditure = 1770 kcals  
**Estimated total energy expenditure = 3800 kcals**

#### Female:

Estimated baseline energy expenditure = 1830 kcals  
Estimated exercise energy expenditure = 1770 kcals  
**Estimated total energy expenditure = 3600 kcals**

### DAILY ENERGY PROFILE

[CLICK TO VIEW](#)



#### CARBOHYDRATE MATCHING IN ACTION:

Carbohydrate matching helps support energy availability and perpetual metabolism - the light blue curve indicates the portion of the intake that is added specifically to meet the day's training demands, a.k.a. Carbohydrate Matching!

The blue and red lines indicate the balance of energy (intake versus expenditure) over the entire day - this sample fueling profile is completely balanced resulting in high energy availability for the athlete's training and recovery.



# FUELING WITH A PURPOSE

by Kelsee Gomes, MS, RD, CSSD, LDN, CLT

## FUEL TO BE STRONG • FUEL YOUR BODY • FOOD IS FUEL

Fuel with a purpose. Fuel to be strong. Fuel your body. Food is fuel. These are just a few of the messages sports dietitians use to promote optimal fueling and a healthy body image. Many successful athletes are motivated by a desire to excel and have a natural competitive nature, often possessing driven and perfectionistic personalities. It is not uncommon for athletes to begin to take workouts and dietary practices to unhealthy extremes in order to achieve success. As the prevalence of disordered eating in sport continues, sports dietitians and all medical personnel must learn to identify properly and follow evidenced based-practice when treating athletes with these issues.



### DISORDERED EATING

Disordered eating occurs when attitudes toward food, body weight, and size lead to eating and exercise habits that could potentially be dangerous to one's health and well-being. Higher rates of **eating disorders (ED)** have been found in elite athletes compared to non-athletes.



### SIGNS & CONSEQUENCES

- Training more than recommended.
- Overuse injuries or stress fractures.
- Low energy availability.
- High level of anxiety when unable to practice or train.
- Negative comments about weight or being "fat".
- Avoidance of social situations, esp. those involving food.
- Loss of muscle.
- Decrease in testosterone levels in men.
- Fatigue.
- Dehydration.
- Electrolyte imbalance.
- Low blood sugar.

### CAUTION

#### OTHER RISKS/DETRIMENTS TO PERFORMANCE:

- Decrease in speed.
- Decrease in endurance and coordination.
- Increased risk of injury due to under-fueling weak bones.
- Menstrual irregularities.
- Chronic muscle soreness.
- Low energy + increased recovery time.

### WAYS TO FOSTER HEALTHY EATING PRACTICES AMONG YOUR ATHLETES:

- Promote realistic goals to avoid physical/mental burnout.
  - Focus should be on fitness levels and performance, rather than body weight.
- Help your athletes strive for balance between exercise and eating.
- Encourage mindful and purposeful eating by honoring their hunger cues.
- Remind your athletes that celebrities and models aren't D1 athletes, and make them aware of how celebrity photos are often altered with airbrushing, etc.

- Help your athletes avoid comparing their bodies to athletes on TV.
  - "Your body is unique to you!"
- Work with your athletes on "body satisfaction."
  - Remind them to be proud of everything that their body does for them.
- Work with athletes on developing healthy and positive thoughts about food, food groups, and body image.
  - "Food is fuel for my performance."
  - "Carbohydrates provide my body with the energy I need and help with my recovery."
  - "Fats are essential for nutrient absorption and hormonal balance."



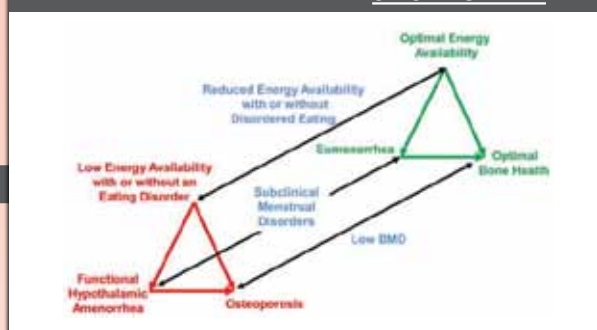
# FUELING WITH A PURPOSE

## FEMALE ATHLETE TRIAD VS. RELATIVE ENERGY DEFICIENCY IN SPORT (RED-S):

The International Olympic Committee (IOC) states the current concept of Female Athlete Triad may not address consequences of low energy availability for male athletes, non-Caucasian athletes, and disabled athletes.

- The IOC has broadened and redefined its previous consensus statement on the Female Athlete Triad as Relative Energy Deficiency in Sport (RED-S).
- RED-S—a syndrome of “impaired physiological functioning including, but not limited to, metabolic rate, menstrual function, bone health, immunity, protein synthesis, cardiovascular health caused by relative energy deficiency.”
- The RED-S theory still requires more research and validation, so it is not yet fully accepted by all members of the research/medical community.

### FEMALE ATHLETE TRIAD - [CLICK TO VIEW](#)



### RED-S THEORY - [CLICK TO VIEW](#)



## KEY CONCEPT:

**Energy Availability (EA) = Energy Intake (EI) – Energy Expenditure (EE)**

Health and nutrition professionals can address low EA by helping athletes work on increasing calorie intake and/or decreasing activity.

## STEPS TO TAKE WHEN CONCERNED ABOUT AN ATHLETE WITH DISORDERED EATING/EATING DISORDERS:

### 1. IDENTIFICATION:

If a teammate or health professional witnesses an athlete displaying signs or symptoms of an eating disorder, he or she should inform an athletic trainer or medical staff member about the observed behaviors.

### 2. REFERRAL:

Appropriate intervention involves an expression of concern regarding a student athlete's display of specific eating or exercise behaviors that may interfere with his or her health and athletic performance.

- Build trust with the athlete by showing your concern and ensuring confidentiality.
  - Provide only need-to-know information to the coach.
- Request that the student-athlete meet with the designated medical staff member, who will determine appropriate referrals to the designated physician, psychologist, registered dietitian, or other providers.
- Ensure a team approach and regular communication.

### 3. TREATMENT & INTERVENTION:

An individualized treatment plan will be determined based on initial assessments from the treatment providers.

- Nutrition education and counseling should be provided in order to focus on “fueling with a purpose” and developing mindful eating strategies.
  - Sports dietitians or sports psychologists should address barriers, challenges, psychological issues in achieving adequate calorie intake.
- When there is no sports dietitian available or the sports dietitian on staff does not have a specialization in EDs, refer out to a registered dietitian in the community who specializes in eating disorders.



# FUELING TO WIN:

## SMART SHOPPING STRATEGIES & EASY RECIPE IDEAS | by Kristina LaRue, RD, CSSD, LDN

The old motto rings true for nutrition...fail to plan, plan to fail. Athletes train their bodies for hours every day, and the type of fuel they put in can make or break performance gains. Athlete schedules are jam-packed and how they manage their time and feed their body can give them a competitive advantage. Carving out one hour a week to grocery shop and to prep food will positively impact daily food choices and sports performance.

### SMART SHOPPING

- Plan your meals for the week and create a list based on foods you need.
  - Check your pantry & fridge for those foods before you shop.
  - Stick to your list!
- Shop the perimeter of the grocery store first to find less processed foods, (i.e. fresh produce and meats).
- Don't go to the grocery store hungry—you'll be more likely to buy "splurge" foods.
- Check store ads and look for store BOGO (Buy 1, Get 1 Free) deals and specials.
- Don't rationalize buying something just because it is on sale.
- Buy store brands to save \$. Quality is the same but price is lower.
- Weigh the cost of convenience.
  - Pre-cut veggies, pre-cooked meats (i.e. grilled or rotisserie chicken) and hard-boiled eggs—may be more expensive, but they simplify meal prep and make healthy eating more convenient.
- Don't buy more than you'll eat.
- Color your cart: your grocery cart should look like your plate, full of different colors.

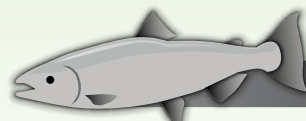


### HOW TO SHOP EACH SECTION



#### PRODUCE

- Color your cart with a variety of colors of produce.
- Buy what's in season = often cheaper.
- Remember the 3F's—Fresh & Frozen First!
- Frozen is just as nutrient-packed & won't spoil as quickly.
- Canned produce—stock your pantry with beans, tomatoes, corn and tomato sauce for quick meal prep.



#### MEAT/SEAFOOD

- Choose leaner cuts (look for the words - round, loin).
- Choose less marbling for less fat.
- Aim for meats that are 90% lean or higher.



#### DELI

- Hummus or guacamole are great sources of healthy fat.
- Rotisserie chickens are quick, easy protein.
- Deli meat makes a convenient protein-rich snack (Look for nitrite/nitrate free).



#### BREAD

- Look for 3g fiber per slice.
- Look for *whole grain* as 1st ingredient.
- Ensure *sugar* is not listed in the first 5 ingredients.



#### DAIRY

- Soy milk is an adequate substitute for cow's milk if dairy needs to be avoided.
  - Almond milk is not an ideal substitute—providing only 1g protein per cup.
- Choose Greek yogurt for 3x more protein than regular yogurt.
- Eggs are the cheapest source of high quality protein.
- Choose low-fat or reduced fat vs. whole milk.

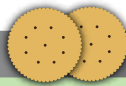


# FUELING TO WIN:



## FROZEN FOOD

- Look for pre-cooked, frozen chicken breast.
- Frozen vegetables are fast, easy and nutritious.
- Frozen stir-fry meals are quick and easy, but most frozen dinners are low in nutrients + overpriced.
- Frozen fruit is a great addition for smoothies.



## CENTER AISLES

- Cereals — Rule of 3's — Choose one with at least 3g fiber & 3g protein.
- Choose fruits canned in own juice.
- Choose oil-based dressings vs. cream-based.
- When buying crackers, choose whole grain, with 3g+ fiber.

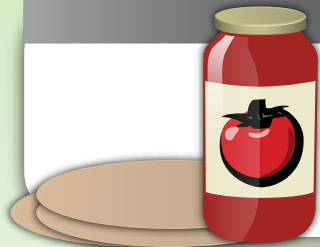
## SIMPLE “RECIPES”

### CHERRY TUNA SANDWICH:



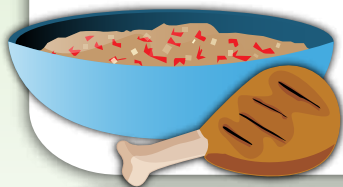
- Mix canned tuna (or chicken) with mayo, tart cherries and sliced almonds together in a bowl, and spread on whole grain bread.

### CHEESY TORTILLA PIZZA:



- Place wheat or corn tortilla on a plate and spread with marinara sauce.
- Sprinkle with mozzarella cheese and top with diced veggies and pre-grilled chicken.
- Microwave until cheese melts and chicken is warm.

### CHICKEN BURRITO BOWLS:



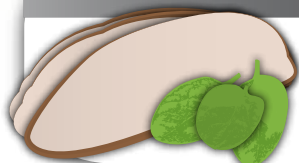
- Microwave “minute” brown rice according to package directions.
- Top with canned black beans, shredded rotisserie chicken, canned tomatoes, diced onions and peppers, shredded lettuce, cheese, guacamole and salsa.
- Heat again for 60 seconds.

### 60 SECOND EGG SANDWICH:



- Spray a microwave-safe coffee mug with cooking spray, whisk an egg in the mug with a fork, sprinkle with cheddar cheese and cover mug with a paper towel.
- Microwave egg for 60 seconds until cooked.
- Place egg and cheese on whole wheat English muffin. Add spinach and Canadian bacon if desired.

### TURKEY ROLL-UPS:



- Layer deli turkey, cheese, and spinach on a wheat tortilla.
- Roll tortilla up to form wrap and enjoy with a simple side salad.





# PROBIOTICS AND THE GUT

by Maria Breen, MS, RD, CSSD, LD

## BACTERIA LINGO:

**Probiotic:** derived from the Greek language, meaning “for life” or life-promoting.

**Probiotics:** microorganisms that, when administered in adequate amounts, can benefit health (“good” bacteria).

**Prebiotics:** non-digestible carbohydrates that feed and stimulate growth of probiotics.

**Synbiotics:** a product that contains both probiotics and prebiotics.

## THE DL ON GUT BACTERIA:

- The gut contains about 100 trillion bacteria.
- All the bacteria in your gut combined is estimated to weigh about 2lbs.
- You have 10x more bacteria in your gut than cells in your body.
- 70% of your immune system is located in your gut.
- Researchers now call our bacteria its own distinct organ: the microbiome.



## BUG (PROBIOTICS)

### BENEFITS:

- Reduce symptoms of constipation, irritable bowel syndrome (IBS) & inflammatory bowel disease (IBD).
- Decrease acute diarrhea, antibiotic-related diarrhea & symptoms of lactose intolerance.
- Support a healthy immune system & prevent infections.
- Enhance digestion & nutrient absorption.
- Reduce inflammation & possible link to weight control.

## OTHER INDICATIONS FOR PROBIOTIC USE:

- Medications (i.e., antibiotics).
- Stress—physical & emotional.
- Poor Diet: processed foods, alcohol, over-eating, low fiber, low produce intake.



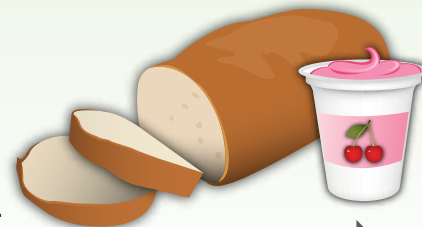
## FACTS:

- ✓ Each group of bacteria has different species and each species has different strains.
- ✓ Each strain has different benefits for different parts of your body. Effectiveness depends on the strain and dose.
- ✓ Doses are measured in CFUs: Colony Forming Units.
- ✓ A probiotic should contain several billion CFUs to increase the likelihood of adequate gut colonization.
- ✓ More is not better; amount needed depends on the strain. Doses typically range from 1-20 billion CFUs.

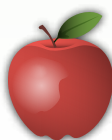
## FOOD SOURCES OF PROBIOTICS—EAT YOUR “BUGS!”

\*Look for “contains live active cultures” on the label\*

- Yogurt.
- Kefir.
- Sauerkraut or kimchi.
- Miso.
- Sourdough bread.
- Kombucha or fermented tea.



## FOOD SOURCES OF PREBIOTICS—EAT YOUR BUG FOOD!



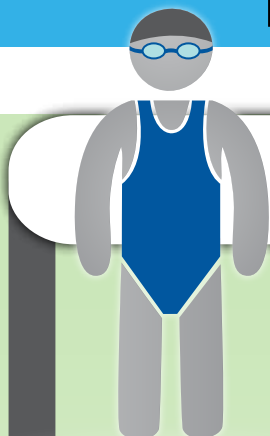
- Legumes & whole grains.
- Fruits.
- Flax.
- Garlic & onion.

Note: The FDA has not approved any health claims for probiotics, and many probiotic supplements are not tested for safety or efficacy prior to being marketed. Make sure to talk to your sports dietitian before taking or recommending any supplements.



# FAD DIET CONFUSION

by Amanda Poppleton, MFN, RD, LDN



The goal of a fad diet is weight reduction. Fad Diets may eliminate at least one essential food group, or may recommend a type food or food group in excess.

- Intended to produce results too quickly compared to a traditional diet program.

Not all diets are appropriate for every population and this is especially true of an athlete in training.

The special needs of an athlete include:

- Higher carbohydrate needs.
- Higher protein needs.
- Higher caloric needs due to training and higher amount of lean mass.
- Frequent fueling before training and post-workout recovery nutrition.

## PROS & CONS OF FAD DIETS

### PROS

- Provides rules, making it easy to follow.
- Provides structure to any unstructured eating pattern.
- Usually faster results.
  - Some of these may be too large and too fast because of the extreme nature/change of some diets.

### CONS

- May eliminate one or more essential food groups or nutrients: carbohydrates, grains, most produce, fat, dairy products, or red meat.
- Usually reduces weight too quickly, causing a loss of muscle.
- Often not sustainable, causing weight re-gain after diet is discontinued.
- May also lead to more weight gain than initially lost.
- Severe restriction of certain foods can put many at risk for binge eating over time.
- Recommends an overconsumption of a type of food to replace others.
- Regimen that is extreme in nature.

PALEO DIET

GLUTEN  
FREE DIET

INTERMITTENT  
FASTING

## POTENTIAL PITFALLS FOR ATHLETES

### LOW CARBOHYDRATE CONSUMPTION:

- Poor energy levels during activity.
- Depletion of glycogen stores, leading to worsening fatigue and increased injury risk.
- Increased risk of cramping due to inability to retain water & inadequate energy intake.
- Poor focus, mood, and cognition related to the brain not being properly fueled.
  - The brain relies on carbohydrates only for fuel.
  - Absolute minimum amount of carbohydrates for a **non-athlete** to consume daily = ~130g (\*\*Brain requires ~130g of carbohydrates to function).
  - Athletes need to fuel both their brain and their training, and therefore will require much more than 130g of carbohydrates.

### LOW SODIUM CONSUMPTION:

- Increased risk of cramping from a decrease in water retention and poor sodium replenishment.
  - Sodium is the electrolyte lost most in sweat and in greatest need of replenishment.
- Impaired muscle function from inadequate balance of sodium and potassium.

### FASTING PERIODS:

- Training with low energy levels, leading to poor performance and risk of syncope (fainting and/or drop in blood pressure).
- Depletion of glycogen stores over time if muscles do not receive recovery nutrition.
- Difficult to obtain sufficient calories during shorter feeding windows, which may lead to weight and/or lean tissue loss.
- Body adapts to burning fewer calories and storing fat, which may set the body up for regain of body weight, especially fat mass.
- Lean tissue breakdown.
- Poor focus, mood, and cognition.



# FAD DIET CONFUSION

## EXAMPLES OF FAD DIETS

	PALEO DIET	GLUTEN-FREE DIET	INTERMITTENT FASTING
<b>PREMISE:</b>	Mimics foods eaten by our “hunter-gather” ancestors.	Medical nutrition diet used to treat celiac disease. This should only be used if celiac disease has been diagnosed.	Periodic fasting aiming to curve hunger, which ultimately restricts calories due to shortened feeding window.
<b>PRINCIPLES:</b>	<ul style="list-style-type: none"> <li>• Low carbohydrates: Non-starchy fruits &amp; vegetables making up 35-45% of daily calories.</li> <li>• Higher protein.</li> <li>• Higher potassium, lower sodium.</li> <li>• Moderate to higher fat intake (Mostly omega-3 and omega-6).</li> </ul>	<ul style="list-style-type: none"> <li>• Celiacs must avoid gluten-containing foods: Bread, pasta, cereals, soups, sauces, baked goods, malt, etc.</li> <li>• To protect small intestine from damaging autoimmune response that occurs in celiacs who consume gluten.</li> <li>• Rice products do not contain gluten.</li> </ul>	<ul style="list-style-type: none"> <li>• Includes different variations of fasting.</li> <li>• Drawing out the overnight fast for a specified period of time (16-36 hours) and narrowing the feeding window to 4-12 hours.</li> </ul>
<b>POTENTIAL BENEFITS FOR THE ATHLETE:</b>	<ul style="list-style-type: none"> <li>• Promotes healthy fats.</li> <li>• Promotes fruit &amp; vegetable consumption.</li> <li>• May decrease body weight and/or body fat %.</li> </ul>	<ul style="list-style-type: none"> <li>• Able to alleviate symptoms of those with celiac disease. This should only be used if a gluten allergy is present.</li> <li>• May decrease body weight and/or body fat %.</li> <li>• Elimination of many refined grains, and flour-based sweets (i.e. cookies, cakes, etc.).</li> </ul>	<ul style="list-style-type: none"> <li>• May decrease body weight and/or body fat %.</li> <li>• May provide a different type of structure/change that motivates a person temporarily.</li> </ul>
<b>POTENTIAL PITFALLS FOR ATHLETE:</b>	<ul style="list-style-type: none"> <li>• Favors low carbohydrate consumption.</li> <li>• Favors low sodium consumption.</li> <li>• Restricts many fruits/veggies = inadequate carbs.</li> <li>• Very restrictive &amp; expensive for college athletes w/ limited \$ and time.</li> </ul>	<ul style="list-style-type: none"> <li>• May be hard to meet carbohydrate needs through limited gluten-free food choices.</li> <li>• Possible nutrient deficiencies if not replacing nutrients found in whole grain/gluten-containing foods.</li> </ul>	<ul style="list-style-type: none"> <li>• Would require athlete to train while fasting such as a Muslim athlete during Ramadan.</li> <li>• Inability for proper muscle recovery during fasting periods.</li> <li>• Could potentially be dangerous if athletes have morning practice – risk of syncope.</li> </ul>
<b>EXAMPLE BREAKFAST:</b>	<p>3 eggs, 2 tbsp. olive oil, parsley, 1 grapefruit, Herbal tea.</p> <hr/> <p>560 calories, 30g carbs, 21g protein, 40g fat.</p>	<p>2 cups Rice Chex cereal, 1 cup 1% milk, 1 banana, 1 oz. walnuts.</p> <hr/> <p>645 calories, 99g carbs, 18g protein, 19g fat.</p>	<p>Most fast days/times won't include breakfast as they continue the fast from sleep.</p>

**A leaner body composition does NOT always mean better sports performance! A properly fueled athlete will perform better than a leaner, unfueled athlete.**



# SLEEP FOR SUCCESS

by Rebecca McConville, MS, RD, LD, CSSD

Research has shown that inadequate sleep can lead to reduced markers of performance, including: slower sprint time, reduced endurance, increased heart rate as well as reported changes in mood. Irregular sleep patterns have also been shown to diminish performance in school and other aspects of an athlete's life.

- Deep sleep helps enhance the release of growth hormone, leading to enhanced muscle repair and muscle protein synthesis.
- Sleep deprivation decreases growth hormone, increases stress hormones and affects appetite-regulating hormones, causing adverse effects on glucose tolerance, lean mass and dietary intake.

## HOW MUCH SLEEP IS ENOUGH?

Studies have shown that teenagers need as much, if not more, sleep than younger children (an average of 9.25 hours per night).

- **(Females 8-15, Males 9-16):** 9.5-10 hours sleep a night, +30 min nap between 2-4pm.
- **(Females 15-21+/-, Males 16-23+/-):** 8-10 hours sleep a night, +30 min nap between 2-4pm.

## TIPS FOR A QUALITY NIGHT'S REST



Stick to a sleep schedule, keeping the same bedtime and wake time, including weekends and when traveling.



Practice a relaxing bedtime ritual whether reading, taking a bath or listening to music.



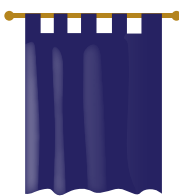
Avoid stimulating activities & electronics that emit blue frequencies—tv, video games, computer, iPhone.

# 30

If you struggle to fall asleep at night, try limiting naps to 30 minutes.



Exercise daily or find another stress relief, such as yoga, hiking or gardening.



### Evaluate your room.

- Keep your bedroom cool—between 60 and 67 degrees; try a fan.
- Drown out sudden noises that will startle you awake—fan, white noise machine, earplugs.
- Reduce light—blackout curtains, eye mask, t-shirt over eyes.
- Sleep on a comfortable mattress and pillows.
- Use bright light during the day and in the morning to help manage your circadian rhythms.



Avoid alcohol & cigarettes.



### Refrain from heavy meals in the evening, spicy foods, fried foods & acidic foods.

- Timing of meals can affect circadian rhythm.



If you can't sleep, go into another room and do something relaxing until you feel tired.



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**Thank you for reading and using these infographics for the education of your athletes.**

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