

A triathlete wearing a yellow and black triathlon suit and a yellow helmet is celebrating with arms raised while riding a bicycle. The background is a dark, textured surface with four circular holes at the top.

# Fueling for Optimal Performance

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A graphic for Twitter featuring a large white bird logo on a blue background with white clouds. The text '@bsinger10' is written in yellow across the bird. The word 'twitter' is written in white at the bottom. In the top left corner, there is a small logo of a person running with the text 'FORGE AHEAD' and the text 'Follow Us on Twitter' in yellow.

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Follow Us on Twitter

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twitter

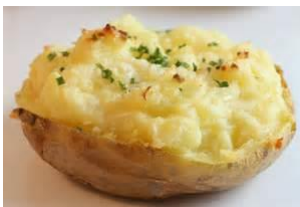


## Topics

- General nutrition
- What occurs during exercise
- Pre training/competition
- Recovery
- RED-S (Relative Energy Deficiency in Sport)








## Carbohydrates



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## Protein

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## Protein: Alternative Sources









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# Protein

**Three T's**

- Total
  - 20-30g @ each meal
- Timing
  - Every 3-4 hours
- Types
  - High quality





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# Portions

- Meat ~3oz.
  - Palm of hand/Deck of cards
  - Deli meats: 3 CD sized
  - Fish: cell phone
- Eggs ~2-3
- Dairy ~8 oz (1 cup).
  - 20 oz. (2.5 cups)
- 1 cup of low fat milk or yogurt


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# Fat

Nuts & Seeds

Avocado

Oils

'Junk Foods'

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# Daily Nutrition Goals

1. Eat 4-6 times a day
2. Include carbohydrate with each meal
3. Consume protein at each meal/ snack
4. Fruit and veggie at each meal
5. Hydrate throughout the day

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# Fueling

**EASY TRAINING / WEIGHT MANAGEMENT:**

**FATS**  
1 Teaspoon

**Grains**  
Whole Grains: Pasta, Rice, Potatoes, Cornmeal, Bread, Legumes  
Lean Protein: Poultry, Turkey, Beef, Pork, Fish, Eggs, Low-Fat Dairy, Soy (tofu, tempeh), Legumes/Nuts  
Vegetables & Fruits: Raw Vegetables, Cooked Vegetables, Veggie Soups, Fresh Fruit

**FLAVORS**  
Salt/Pepper, Herbs, Spices, Vinegar, Salsa, Mustard, Ketchup

Water, Dairy/Non-dairy Beverages, Diluted Juice, Flavored Beverages, Coffee, Tea

Avocado, Oils, Nuts, Seeds, Cheese, Butter

**MODERATE TRAINING:**

**FATS**  
1 Tablespoon

**Grains**  
Whole Grains: Pasta, Rice, Potatoes, Cornmeal, Bread, Legumes  
Lean Protein: Poultry, Turkey, Beef, Pork, Fish, Eggs, Low-Fat Dairy, Soy (tofu, tempeh), Legumes/Nuts  
Vegetables & Fruits: Raw Vegetables, Cooked Vegetables, Veggie Soups, Fresh Fruit

**FLAVORS**  
Salt/Pepper, Herbs, Spices, Vinegar, Salsa, Mustard, Ketchup

Water, Dairy/Non-dairy Beverages, Diluted Juice, Flavored Beverages, Coffee, Tea

Avocado, Oils, Nuts, Seeds, Cheese, Butter

**HARD TRAINING / RACE DAY:**

**FATS**  
2 Tablespoons

**Grains**  
Whole Grains: Pasta, Rice, Potatoes, Cornmeal, Bread, Legumes  
Lean Protein: Poultry, Turkey, Beef, Pork, Fish, Eggs, Low-Fat Dairy, Soy (tofu, tempeh), Legumes/Nuts  
Vegetables & Fruits: Raw Vegetables, Cooked Vegetables, Veggie Soups, Fresh Fruit

**FLAVORS**  
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# Dehydration

When water loss is greater than water consumption, resulting in 2% or greater weight loss

**Water Loss**


- Respiration
- Urine
- Sweat
- Fecal Route

**Water Gained**

- Fluids
- Food


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# Dehydration


% Body Weight Loss	Physiological Effect
1-2%	Thirst, some fatigue, some strength loss, power loss, decreased endurance
3-4%	Decreased aerobic endurance, decreased thermoregulation
5-6%	Decreased concentration and focus, decreased cardiac output, nausea, chills, hyperventilation
7-10%	Dizziness, muscle spasms, poor balance, delirium, potential for cardiogenic shock



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# Daily Hydration Tips

- Carry fluids at all time
- Cold/flavored fluids typically more palatable
- Juice, tea, milk, sports drink, flavored water all counts toward hydration
- Alarms/Reminders/Volume Goals can keep you on track







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 <b>FORGE AHEAD</b> <h1>Fluid Options</h1>			
Category	Water	Low/No Calorie Sports Drink	Sports Drink
Contains	Fluid	Fluid, Electrolytes	Fluid, Electrolytes, Carbohydrates
Best For	<ul style="list-style-type: none"> <li>• Daily Hydration</li> <li>• Light Intensity</li> <li>• Short Duration</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy Sweating</li> <li>• Light Intensity</li> <li>• Short Duration</li> </ul>	<ul style="list-style-type: none"> <li>• High intensity efforts</li> <li>• Long duration activity</li> <li>• When peak performance is needed</li> </ul>
<div>    </div>			

 <b>FORGE AHEAD</b> <h2>Pre/During/Post Exercise Nutrition</h2>	
	
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## Muscle Energy Usage

The diagram illustrates the progression of muscle energy usage through three stages, connected by blue arrows:

- At Rest:** A man is sleeping. Below him is an illustration of three yellow fat cells, each labeled "Fat".
- Moderate Exercise:** Two people are jogging on a path. Below them is an illustration of a muscle labeled "glycogen" and a plus sign next to a small illustration of a fat cell labeled "Fat".
- Intense Exercise:** A group of people are running on a track. Below them is an illustration of a muscle labeled "glycogen" and a plus sign next to a small illustration of a muscle labeled "glucose".

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## What to Consume

- Easily digestible carbohydrates
- Fluids
- Small portion of lean protein if preferred

The images show a variety of food items and a drink: a bagel, a bunch of green grapes, a bunch of yellow bananas, a grill with several pieces of grilled chicken, and a small yellow bear-shaped container, likely for sports drink powder.

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## What to Avoid Right Before an Event/Game

- High fiber foods
- High fat foods
- Greasy foods
- Too large of portions

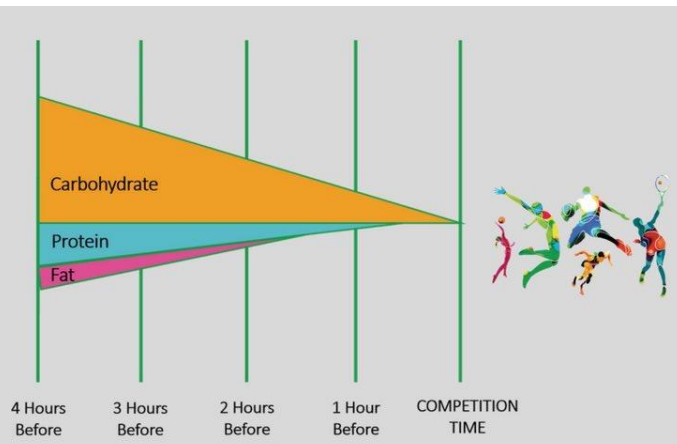


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## Pre Competition Meal




**PRE-COMPETITION FUELING**

Your pre - competition meal (3-4 hours before) should be high carbohydrate, moderate protein & lower fat. As competition time gets closer, the size of meals/snacks should decrease and shift towards mostly carbs with minimal protein & fat.



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## Pre Competition Meal

3-4 Hours Before	1-2 Hours Before	< 1 Hour Before
Oatmeal with Dried Fruit and Honey	Bagel with small portion of Peanut Butter and Honey	Applesauce
Banana	Water	Water
Sports Drink		
1-2 Eggs Scrambled		





## Should you eat breakfast?


Yes!

- Energy to focus during class or practice
- Protein for muscle growth and repair

Do you have to eat breakfast when you first wake up?

- Eat at school/ first period (if allowed)





# What to eat for breakfast?


## Breakfast before school:

- Protein source- eggs, greek yogurt, kefir, cottage cheese, milk, etc.
- Carbohydrates- cereal, oats, granola, fruit
- Fluids- Water, 100% juice, milk

## Breakfast before morning practice?


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# Recovery


3 R's of recovery:


- Replenish
- Repair
- Rehydrate

Sleep

- Importance of sleep
- Sleep hygiene



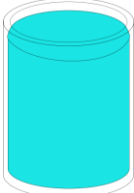



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## Three R's of Recovery

- Rehydrate: With fluid and electrolytes
  - 20-24 oz. for every lb. lost
- Replenish: Glycogen with carbohydrates
  - ½ g / lb. of total body weight
- Repair: With protein
  - 15-30g protein



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## Sleep: How Much?

- 8.5-9.5 hours a night for teens ages 12-17
- 7-9 hours a night for adults 18 and up
- Athletes likely need more.




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## Tips for improving Sleep Hygiene

- Be consistent with bed time and wake up time
- Start winding down before bedtime
  - Turn off TV/Phone
  - Turn lights down or off
- Use bed for sleeping only
- Keep noise to a minimum
- Keep room cool and dark






## Contact Me

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- Twitter: @bsinger10;
- <http://ironman.memorialhermann.org/>









## Resources

- **ACSM**
  - <http://journals.lww.com/acsm-msse/pages/collectiondetails.aspx?TopicalCollectionId=1>
- **National Eating Disorder Association (NEDA):**
  - <http://www.nationaleatingdisorders.org/athletes-and-eating-disorders>
- **RED-S Article:** <http://bjsm.bmj.com/content/48/7/491.full>
  - Mountjoy M, Sundgot-Dorgen J, Burke L, et al. Br J Sports Med 2014; 48: 491-497.
- **RED-S:**
  - <http://www.olympic.org/news/ioc-medical-commission-to-reveal-new-insights-into-the-female-athlete-triad/221481>
- **SCAN: Sports, Cardiovascular and Wellness Nutritionists:**
  - <http://www.scandpg.org/>
- **USOC USA Olympic Dietitians and Resources:**
  - <http://www.teamusa.org/About-the-USOC/Athlete-Development/Sport-Performance/Nutrition>



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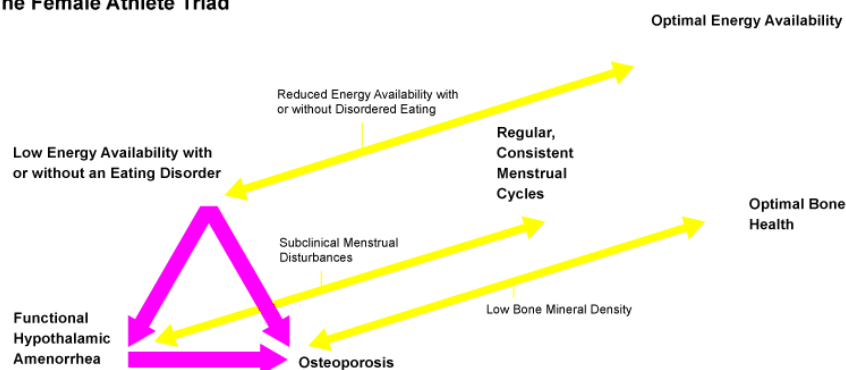


## Female Athlete Triad


**Low Energy Availability (EA)** = Dietary intake  
does not meet the needs of energy  
expenditure

- Can lead to disruptions in menstrual function and poor bone health
- Amenorrhea: an absence of the menstrual cycle for 3 consecutive months


### The Female Athlete Triad



**Figure 1:** The spectrums of the Female Athlete Triad including energy availability, menstrual function and bone mineral density exist on a continuum between health and disease.






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Examples for Increasing Energy Intake			
+	++	+++	++++
8 fl oz of milk	16 fl oz of milk	2 slices of bread 2 tablespoons of peanut butter	2 slices of bread 2 tablespoons of peanut butter 1 large banana + 1 glass of milk
1/2 cup of cooked oatmeal	1 cup cooked oatmeal	1 cup of cooked oatmeal 1 cup of milk 1 large banana	2 cups of cereal 2 cups of milk
1 tablespoon of peanut butter	2 tablespoons of peanut butter	1 cup cooked pasta 3 oz chicken 1 cup grapes	2 cups of cooked pasta or rice 3 oz chicken Cooked vegetables with a little oil



## Low Energy Availability

- May affect male or female athletes
- Intentional or unintentional
  - Healthy balanced eating most of the time with occasional use of short-term weight loss methods
  - Less than 30 calories/kg of FFM/day
- Energy Balance: 45 calories/kg of FFM/day



## Questions to Ask:

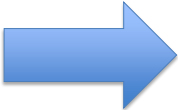
- Do you have an abnormal relationship with food?
- Do you skip meals or snacks?
- Are you trying to lose weight?
- Do you weigh regularly?
- Have you lost more than 15 pounds in 2-3 months or 5 pounds in 1 month?
- Would you say food dominates your thoughts, mood, life?
- If you eat a food that you consider “bad,” do you think about it all day?
- For females: Are you having regular periods? Are you on OC?

## Treatment

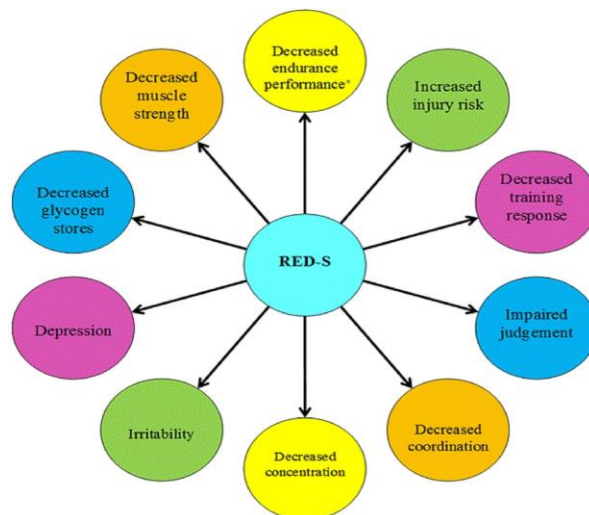
- Multidisciplinary team:
  - Sports medicine physician, exercise physiologist, sports dietitian, sports psychologist, athletic trainer, coaches and family
- Regain normal menstrual function
- Adjust energy intake to meet training and competition needs
- Treat nutritional problems and monitor nutrient status (iron, calcium, vitamin D)



## Treatment for Low Energy Availability

- Increase energy intake
  - Reduction of exercise
- 
**Combination of both**
- One strategy would be adding a liquid meal replacement drink + one day of rest.
  - Meal plan that includes an additional 300-600 calories per day as well as addressing excessive energy use exercise throughout the day.

## Potential Performance Effects of Relative Energy Deficiency in Sport (\*Aerobic and anaerobic performance).



Margo Mountjoy et al. Br J Sports Med 2014;48:491-497