

Over the years there have been commonly-asked-questions from our student-athletes pertaining to nutrition and physical comfort. Starting back in the mid-1990s, I began to put the questions to physicians, and collected the following information together into answers which keep the spotlight on kids goals of athletic performance.

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The Female Athlete 101

Anemia and the Female Triad

Anemia is defined in Webster's New World Dictionary (1988) as "a condition in which there is a reduction of the number, or volume, of red blood corpuscles or of the total amount of hemoglobin in the bloodstream, resulting in paleness, generalized weakness, lack of vigor or vitality, etc." In short, since iron-rich blood and hemoglobin go hand-in-hand, being anemic implies an iron-deficiency in ones diet.

↳ What warning signs can suggest an iron deficiency?

- ↳ Poor race performance wherein one may feel good at the start of a race and lose all energy; always tired and sleepy.
- ↳ Other non-running signs: Skin that has suddenly become more pale in color; if the white half-moon shape at the base of your nails changes shape; if the pink flesh surrounding your eye (when you pull down your eyelid) actually appears white.

↳ Which vitamins contribute to or distract from your body's ability to absorb iron?

- ↳ Foods which actually **speed up/enhance** your body's absorption of iron include Vitamin C, fruits (oranges, cantaloupe, strawberries, grapefruit, berries), certain vegetables (broccoli, brussel sprouts, tomato, potatoes, green and red peppers).
- ↳ Foods which actually **slow down or otherwise inhibit** your body's absorption of iron include egg yolk, cereals and wheat (because of the bran fiber), soy products, milk, coffee and tea (because of the phosphoprotein), and certain vegetables (spinach, chard, beet greens, rhubarb, sweet potato).
- ↳ Also, calcium and zinc compete with the iron for the same cellular receptors, and so they are things to keep an eye on. Try to stagger these foods when you have them. It is harder for your body to absorb iron found in fruits, vegetables and grains, than the kind of iron found in animal foods (such as in red meats, chicken and fish.)

↳ Why must young runners be careful about the amount of iron they get?

- ↳ The physical impact on your body from a lack of iron is detrimental. However, getting too much iron creates a state referred to as "iron toxic"; it is a state which closely resembles the same symptoms of an iron deficiency.
- ↳ If you're normally eating a balanced food diet, you'll be just fine.
- ↳ The only serious dangers to entering into an iron toxic state is when people take too much iron supplements. Be wary of this; if you chose to take iron supplements, never surpass the limit specified on the instructions.

↳ If I'm a vegetarian, how might I get iron in my diet (without taking iron supplements)?

- ↳ Iron-rich foods include spinach, oatmeal, lean red meats (beef, pork, lamb), seafood (oysters, clams, tuna, salmon, shrimp), liver, leafy vegetables, chicken, turkey, lima beans, baked or boiled potatoes, baked beans with molasses, broccoli, brussel sprouts, tofu, nuts, egg yolks, dried fruits (raisins, prunes, dates, apricots), asparagus, prune juice, walnuts, and soybeans.

What is the Female Athlete Triad?

- ↳ Many girls have concerns about body image. This is natural. But participating in a sport that requires you to train extra hard can increase that worry. Girls often care so much about their sports that they would do almost anything to improve their performance. For some girls, not balancing the needs of their bodies and their sports can have major consequences. This "Female Athlete Triad" is a combination of three conditions: disordered eating, amenorrhea, and osteoporosis.

1. Disordered Eating (which contributes to low energy availability)

- ↳ Energy availability is defined as energy intake minus energy expended. Energy is taken in through food consumption. Our bodies expend energy through normal functioning as well as through exercise. In the triad, low energy availability may be coupled with eating disorders, but not necessarily so. Athletes may experience low energy availability by exercising more without a change in eating habits, or they may increase their energy expenditure while also eating less.
- ↳ While most athletes do not meet the criteria to be diagnosed with an eating disorder such as anorexia or bulimia, many will exhibit disordered eating habits. Some examples of disordered eating habits are fasting; binge-eating; purging; and the use of diet-pills or laxatives. By restricting their diets, athletes worsen the problem of low energy availability.
- ↳ More significantly, having low dietary energy from excessive exercise and/or dietary restrictions leaves too little energy for the body to carry out normal functions, such as proceeding through a regular menstrual cycle or conducting bone maintenance.

2. Amenorrhea

- ↳ Exercising intensely and not eating enough calories can lead to decreases in estrogen, the hormone that helps to regulate the menstrual cycle. As a result, a girl's cycles may become irregular or stop altogether. Of course, it's normal for teens to occasionally miss their period, especially in the first year. A missed period does not automatically mean female athlete triad. It could mean something else is going on (speak to your doctor if this is happening)
- ↳ Some who participate intensively in sports may never even get their first period because they've been training so hard. Others may have experienced their cycle, but once they increase their training and change their eating habits, their cycle may cease.

3. Osteoporosis

- ↳ Low estrogen levels and poor nutrition, especially low calcium intake, can lead to osteoporosis, the third aspect of the triad. Osteoporosis is a weakening of the bones due to the loss of bone density and improper bone formation. This condition can ruin a female athlete's career because it may lead to stress fractures and other injuries;
- ↳ Usually, the teen years are a time when girls should be building up their bone mass to their highest levels. Not getting enough calcium now can also have a lasting effect on how strong a woman's bones are later in life.

IF ANY OF THE ABOVE IS CONCERN, PLEASE MAKE AN APPOINTMENT TO SEE YOUR FAMILY PHYSICIAN

The Female Athlete 102

Vitamin B-5 and Menstrual Cycle Info

Is there anything which will help minimize girl's menstrual discomfort?

- ↳ According to doctors I've spoken with, Vitamin B-5 is the way to go.
 - ↳ Take the vitamin beginning two weeks before you ovulate and continue for your cycles-duration. For many this helps ease the discomfort and cramps often associated with periods. Also, keep in mind too that if you feel menstrual-like discomfort but the time of the month is wrong, then it is quite possibly caused by dehydration.
- ↳ What could happen if you have a deficiency in Vitamin B-5 (aka. "pantothenic acid")?
 - ↳ Fatigue, listlessness, and sensations of weakness
 - ↳ Burning foot syndrome
 - ↳ A very rare condition; it is a numbness and tingling, together with burning and shooting pain in the feet
 - ↳ While other B vitamins (like B-1 and B-3) help lesson the symptoms, B-5 is required to end the burning sensation.
 - ↳ For girls, difficult menstruation periods
 - ↳ Why? Vitamin B-5 eases/relaxes the uterine walls and affects hormones.
 - ↳ Other things which could help to reduce menstrual cramps (in the week prior to your cycle):
 1. Limit your caffeine, sugar, fat and salt/sodium intake. (Avoid pizza, hot dogs, canned soups, Chinese food....cutting down on salt/sodium may help to control bloating by lowering the amount of fluid in your system.)
 2. Eat complex carbohydrates which are high in fiber (whole grain breads and high fiber cereals instead of white bread and sugar cereal)
 3. The more calcium in your system, the better. Also, keep hydrated; drink plenty of water
 4. Some girls use painkillers, like ibuprofen. *Coaches will not advise the use of drugs; that is up to you and your parents.*
 5. Daily exercise is good, and teens should try to get about nine hours of sleep.

Vitamin B-5 is essential for the metabolism of food as well as in the formation of hormones and (good) cholesterol. ***There is no need for supplements; Vitamin B-5 occurs in many foods, so just be sure you are eating a well-balanced diet and you will be fine.***

The following are respectable sources of Vitamin B-5.

Fruit sources:

Avocado	2.79 mg
Pomegranate	1.06 mg
Breadfruit	1.05 mg
Dates	.86 mg
Guava	.74 mg
Grapefruit	.65 mg
Watermelon	.63 mg
Cherimoya	.55 mg
Starfruit/carambola	.51 mg
Black Currants	.44 mg
Gooseberries	.42 mg
Raspberries	.40 mg
Banana	.39 mg
Blackberries	.39 mg
Loganberries	.39 mg
Pineapple	.35 mg
Mango	.33 mg
Boysenberries	.33 mg
Orange	.32 mg
Papaya	.30 mg
Cranberries	.29 g
Cherries	.27 mg
Nectarine	.26 mg
Plum	.22 mg
Peach	.22 mg
Figs	.19 mg
Blueberries	.18 mg
Strawberries	.18 mg

Vegetable sources:

Spirulina/Seaweed	3.89 mg
Sweet potatoes	1.00 mg
Corn	.93 mg
Parsnip	.91 mg
Lima beans	.79 mg
Potatoes	.65 mg
Squash (zucchini)	.55-.20 mg
Mushrooms	.52 mg
Pumpkin	.49 mg
Broccoli	.48 mg
Brussel Sprouts	.39 mg
French beans	.39 mg
Okra	.34 mg
Cauliflower	.31 mg
Taro	.31 mg
Celery	.29 mg
Artichoke	.28 mg
Swiss chard	.28 mg
Peas	.24 mg
Turnip greens	.22 mg
Asparagus	.20 mg
Fennel	20 mg

Nut and Seed sources:

Sunflower Seeds	1.99 mg
Rye	1.45 mg
Oats	1.34 mg
Buckwheat	1.23 mg
Wheat	.95-.93 mg
Chestnuts	.46 mg
Peanuts (in shell)	.39 mg
Brown Rice	.39 mg
Hazelnuts	.26 mg
Cashews	.24 mg
Coconut	.24 mg
Pecans	.24 mg
Macadamias	.21 mg

Meat/protein sources:

Fish (salmon)	1.92 mg
Low fat yogurt	1.44 mg
Fish (tuna)	1.37 mg
Scrambled eggs	1.22 mg
Turkey leg	1.20 mg
Veal	1.19 mg
Chicken (dark meat)	1.11 mg
Roasted duck	1.09 mg
Beef	.97 mg
Yogurt	.95 mg
Chicken (breast)	.93 mg
Milk (cow)	.91 mg
Soy milk	.90 mg
Milk (goat)	.75 mg
Fish (herring)	.74 mg
Pork	.69 mg
Turkey (breast)	.63 mg
Fish (catfish)	.61 mg
Hamburger	.53 mg
Sausage (beef)	.51 mg
Cream cheese	.48 mg
Cheddar cheese	.46 mg
Roasted soybeans	.45 mg
Bacon	.37 mg
Sausage (pork)	.34 mg
Sour cream	.33 mg
Cottage cheese	.28 mg
Hot dog (turkey)	.25 mg

Too much Vitamin B-5 can cause mild diarrhea. But don't worry, "too much" is several hundred times the recommended daily allowance level (5 mg/daily is recommended), so barring the taking of supplements the odds are you'll never reach that level of toxicity.

To see specifics as to what quantity of vitamins and minerals are found in foods, check out: <http://www.healthalternatives2000.com/fruit-nutrition-chart.html>

A Primer on Nutrition

What is the Glycemic Index?

↳ A measure of the effects of carbohydrates on blood sugar levels. Carbohydrates that break down quickly during digestion and release glucose rapidly into the bloodstream have a high GI; carbohydrates that break down more slowly, releasing glucose more gradually into the bloodstream, have a low GI. ***This does not consider the nutritional value of foods; rather, it is a measurement of how quickly and how sustained (or not) the food will affect your energy level.*** You want food which will gradually contribute to your energy over time, not ones which quickly spike your blood sugar and then wears off.

What are good foods for a long distance runner to eat?

You want to eat foods which are low on the Glycemic Index, contain few saturated fats (unsaturated fats are ok) and which are high in fiber. You want to consume foods which have carbohydrates which will break down slowly, releasing glucose gradually into the bloodstream.

This would include:

oatmeal	apples	pears	sardines	sweet potato
protein	veggies	cheese	olive oil	spinach
eggs	milk	grapes	peanuts	lean meats
lean meat	yogurt	banana	almonds	brown rice
chicken	fish	cashews	snack bars	spaghetti
fruit	salad	chicken	Spanish rice	wheat products
ice cream	milk	beans	fruit juice	chow mien
macadamia nuts		pizza	nutella	grapes
whole grain foods		Subway sandwich		instant noodles
fish – tuna, trout, herring, mackerel, salmon, cod				
lean animal produce – sirloin, skinless chicken				
unprocessed carbohydrate foods (wheat)				
foods with unsaturated fats				
specific cereals – Special K, All Bran, Life, Shredded Wheat				
calcium-fortified orange juice				

What foods are right at the border between “high” and “low” on the Glycemic Index?

french fries mashed potato's hamburger cheerios

What are NOT good foods for a long distance runner to eat?

Foods which rank high on the Glycemic Index, because the food quickly breaks down and spikes your blood sugar; they will raise your blood sugar level too high and too fast, causing it to crash a short while later (like after your warm up!)

white bread	crackers	baked products	candy
butter	margarine	whole milk	cookies
fried foods	peanut butter	pork	chicken skin
oreo cookies	instant oatmeal	white rice	bagels
pretzels	baked potato	watermelon	rice cakes
fruit roll-ups	jelly beans	honey	waffle
corn tortilla	soda	instant potato	donut
processed carbohydrate foods			
foods high in trans- and saturated-fats			
anything made with “partially hydrogenated vegetable oil”			
specific cereals – Corn Flakes, Rice Krispies, Coco Pops			

Want to learn more? A GREAT source is:

“Fast Track: Training and Nutrition Secrets From America’s Top Female Runner” by Suzie Favor-Hamilton isbn nr.978-1594860133

What can happen with a low protein diet?

1. Passing out during athletic activity.
 - ↳ Iron-rich blood is high in hemoglobin. Oxygen normally attaches itself to hemoglobin and is pumped through the heart and distributed throughout the body. With low protein the blood (hemoglobin) cannot absorb enough oxygen. This means the heart is not receiving the oxygen it needs to sustain a certain level of athletic activity.
2. Longer fatigue after a workout.
3. Exhaustion, which can affect your studies and athletics.

What are really good sources of protein?

↳ Grilled cheese sandwich, milk, eggs, yogurt, lean meats (hamburger), grains, beans, fish, poultry (chicken, turkey)

How important are fluids?

- ↳ It is essential you maintain your body fluid level. Approximately 70% of your body weight is water. When dehydrated you have a smaller volume of blood circulating through your body. Consequently, the amount of blood your heart pumps with each beat decreases and your exercising muscles do not then receive enough oxygen from your bloodstream. Soon you will notice premature exhaustion. Further, a lack of hydration may contribute to likelihood of muscle troubles, such as cramping or long-term tightness.
- ↳ Thirst is not an accurate indicator of how much fluid you have lost. Most people do not become thirsty until they have already lost more than 4% of their body weight. Even if you drink enough to quench your thirst, you may still be dehydrated. It usually takes **three days** to re-hydrate yourself. Do not expect a single bottle of Evian or a sports-drink an hour before race time to solve your problems. Also, try to avoid sodas because not only will it further your dehydration, but it also depletes the calcium in your system.
- ↳ Consider carrying a water bottle with you at school and drink from it throughout the day. Most teachers are ok with this. Prevent yourself from becoming dehydrated in the first place and you have nothing to worry about.

What is the relationship of fats and carbohydrates to performance?

- ↳ Here is an overview of what happens:
- ↳ Your body burns two basic type of fuel: fats and carbohydrates. Fats, tucked away in both fat cells and in muscle fibers, provide more usable energy than an equal amount of carbohydrates. But you need lots of oxygen for fat burning, whereas carbohydrates can supply energy at a lower oxygen cost. Low intensity workouts, such as walking – during which oxygen supply is plentiful – rely more heavily on fat fuel at around 60% fat versus 40% carbohydrate burned. This ratio shifts as workout intensity increases (a brisk 10k run, for example, uses 70% carbohydrate and 30% fat. Endurance exercise like running or bicycling can improve your muscles ability to burn fat.

What are the two types of energy bars widely available?

1. ‘Sustainable Energy Bars’: those with about 150 calories (at least 25 carbohydrates, 15 protein, 5 fat); Ex.: Balance Bar
2. ‘Quick Energy Bars’: these usually have twice as much sugar as a sustainable energy bar. Example: Powerbars
 - ↳ **Do not use energy bars as a regular meal replacement under any circumstances! They are not food substitutes.**

Health Considerations 101

Breathing Difficulties and Mononucleosis

Do you experience difficulty breathing?

Learning to manage your breathing is critical to your success as a distance runner.

- ⇒ If you are out of shape . . .
 - ↳ Check out the list below, although odds are just that you're simply out-of-shape. It takes time to get your lungs in shape.
- ⇒ If you are in shape or have achieved a certain level of fitness, then consider . . .
 - ↳ Your pace in a given run might have been too quick than your body was ready for on that day.
 - ↳ Slow it down and more steadily build toward the pace you want, rather than jumping into it.
 - ↳ Exercise-induced asthma
 - ↳ This condition usually involves a tightening of the airways, a burning sensation in the lungs and an increased production of mucus. Coughing and wheezing are not uncommon.
 - ↳ What do to about it? 1. An Albuterol inhaler is commonly prescribed and works very well. Speak to your doctor.
 - 2. Studies suggest nutrition may positively affect asthma. Nutrients with specific benefits for asthma sufferers are antioxidants (fresh fruits and vegetables), fish oil (fish), B complex multivitamin (B-5, B-6 and B-12), folic acid (peas, oranges, broccoli, spinach), and magnesium (milk, whole grains, nuts, leafy green vegetables).
 - ↳ Allergies
 - ↳ When the body encounters allergens (dust when running indoors; pollen when running outdoors), the immune system kicks into overdrive, releasing chemicals that initiate allergy symptoms. Some allergic reactions simply cause congestion in the nose and throat, making it difficult to breathe. More serious allergic reactions cause anaphylaxis (a severe swelling of the airways that may block or restrict breathing altogether.)
 - ↳ What to do about it? Most respond well to over-the-counter anti-allergy medication.
 - ↳ Vocal Cord Dysfunction
 - ↳ VCD is a condition which may mimic asthma. However, VCD is not helped by asthma medicines. While inhaling the vocal cords should open to let air into the lungs. With VCD the vocal cords close together during inhalation. This makes it difficult for air to get into the lungs. A lot of the same things that trigger asthma can trigger VCD, including upper respiratory infections, fumes, odors, cigarette smoke, singing, emotional upset, post-nasal drip and exercise.
 - ↳ What to do about it? See your doctor.

Mono / Mononucleosis

Mono is a common viral illness (the Epstein-Barr virus) which can leave you feeling tired and weak for weeks or months. (The EBV is of the same family of viruses which include cold sores and chicken pox.) Some who do not take care of themselves report a full year before feeling 'normal' again. It strikes two of every one thousand 15-17 year olds nationally.

Symptoms usually start 4 to 6 weeks after you are exposed to the virus.

- ↳ The most common symptoms of mono are . . .
 - ↳ a high fever (103+ is not uncommon) or – paradoxically – the chills
 - ↳ headache
 - ↳ general body muscle aches
 - ↳ a severe sore throat, possibly with red tonsils or white patches on the back of the throat
 - ↳ swollen glands and tonsils
 - ↳ weakness, steady exhaustion and fatigue
 - ↳ malaise (a feeling of general discomfort or uneasiness, or a general feeling of unwell)
 - ↳ weight loss
 - ↳ vomiting and loss of appetite
 - ↳ petechia (skin rash; small, temporary red or purple spotting on the body)
 - ↳ Mono can cause the spleen to swell. Severe pain in the upper left part of your chest may mean that your spleen has burst (while a burst spleen is rare, it is not unheard of). This is an emergency.
 - ↳ The spleen promotes healing of damaged organs; it is heavily involved in the immune system processes.

How does the virus spread?

- ↳ Mono can be spread through contact with saliva, mucus from the nose and throat, and sometimes tears.
- ↳ It could be acquired through sharing things like drinking glasses, water bottles, eating utensils, or toothbrushes, being too close to someone who sneezes, or even by kissing.

Recovery and long term affects

- ↳ As soon as you get over mono, your symptoms will go away for good, but you will always carry the virus that caused it. The virus may become active from time to time without causing any symptoms.

If any of these symptoms are present, tell your coach and set up an appointment with your family doctor promptly.