

Sierra Marlin Swim Team
Nutrition Talk

- I. Macro- and Micro- Nutrients: Type, Sources, Function
 - A. Macro:
 - i. Carbohydrate (CHO)- Fuel
Sources- Bread, Rice, Pasta, Fruit, Vegetables, Potatoes,
Cereal
 - ii. Fat - Fuel
Sources- Oils, Butter, Animal
 - iii. Protein (PRO)- building/ repairing muscle tissue,
hormones, RBC
Sources- Meat, Eggs, Fish, Cheese, Milk, Nuts, Legumes
 - B. Micro:
 - i. Vitamins & Minerals - Metabolic Functions
Sources- Fruits and Vegetables
 - C. Water - Median for ALL metabolic functions, Temperature
Control
- II. General Dietary Recommendations
 - A. Percent of Total Caloric Expenditure
 - i. Carbohydrate 55 - 60 %
 - ii. Protein 15 - 20% (1.0 - 1.2g/ kg)
 - iii. Fat 30%
 - B. Eat Colorful Foods/ Variety
 - C. Eat/ Drink often and in small amounts
- III. Recommendations for Before, During and After Practice
 - A. Pre - Fill up/ Top off
 - B. During - Replace, Preserve, Maintain, Minimize
 - C. Post - Shift, Replenish, Initiate, Reduce
- IV. Miscellaneous
 - A. Packing for Meets
 - B. Road Trips
 - C. Information on Cereals
 - D. Supplements

Nutrients are the “chemicals” that supply the body with energy. Carbohydrate, protein and fat supply energy in the form of calories. These are your “Energy-Yielding Nutrients.” Vitamins, Minerals and Water don’t supply energy in the form of calories, but their presence is required in order for the body to access the energy provided by carbohydrate, protein and fat.

During exercise, the body gets its energy primarily from carbohydrate and fat. It

likes to save protein for other things (building and repairing muscle tissue, hormones and red blood cells, and supporting the immune system). The only time the body uses protein as an energy source during exercise is when carbohydrate and fat are not present in sufficient quantities. This happens when the total caloric intake is too low over a period of months, and or the bout of exercise is so long that the body's accessible sources of carbohydrate and protein become exhausted. Neither of these scenarios is desirable for swimmers.

Think about money. When you have lots of it, you don't mind paying full price for things. But when money is scarce, or there is just too much you have to buy, you look for bargains. You're not being cheap, just thrifty. Simplified to some extent, your body knows how to shop.

Now instead of dollars, think of your currency as oxygen. When swimming is "easy," say during warm-up or your easiest sets, there is plenty of oxygen available to support the exercise. The body perceives itself as "rich" and doesn't mind splurging on fat (1 gram of fat costs 9 oxygen's). In fact, it automatically does so because it knows it might need carbohydrate at a later time.

When exercise is hard (we're talking *tough* sets, definitely your *hardest* sets), oxygen is not plentiful. In fact, the body needs every bit it can get to support the exercise, but even *that* is often not enough, and the body is forced to derive energy in ways that do not require oxygen (i.e. *anaerobic* metabolism). In this situation, the body perceives itself as very "poor" and becomes very thrifty with its "purchase" of fuel. Since carbohydrate costs less than fat (1 gram of carbohydrate costs 4 oxygen's), the body chooses to rely primarily on carbohydrate for its energy.

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Keep in mind that this entire fuel burning process is never a case of "all or none." In other words, the body is always using some combination of carbohydrate and fat, but the **intensity** of the exercise dictates which fuel source will be the *dominant* one. When swimming is easiest, fat is the primary fuel source. When swimming is toughest, carbohydrate is the primary fuel source. When swimming is about 50% of maximum effort, carbohydrate and fat contribute about equally.

Let's face it – the majority of workouts are hard. Above 50% for certain. If you consider the typical swim workout, it's pretty safe to say that **the primary fuel source for swimmers IS carbohydrate.**

Eat Colorful Foods.

What are the first three foods that come to mind when we say "carbohydrate?"

1. Pasta
2. Rice

3. Bread

Each of these is excellent. But what do they have in common? They're all white!

One of the most overlooked sources of carbohydrate is fruit. Yes, FRUIT. Fresh, canned, frozen, dried or juiced. No matter how you look at it, fruit is an excellent source of carbohydrate. Not only does fruit provide carbohydrate in the form of natural sugars (versus refined sugar), the bright colors of fruits indicate that they are also excellent sources of vitamins and minerals, including a sub-group called **anti-oxidants**.

You might recall that exercise is the stimulus that leads to training adaptations. And that adaptations to training occur ONLY if you give the body the right kinds of fuels during periods of rest.

Well, one of the side effects of exercise is the generation of "*free radicals*." Free radicals are molecules that can actually cause damage to muscle tissue above and beyond the damage caused by exercise. The damage caused by exercise is normal. It serves as part of the stimulus for training adaptation to take place. But damage caused by free radicals is NOT a desired part of the training process. Damage caused by free radicals (aka "scavengers") circulating in the bloodstream after workout can continue well into the recovery period. This is when the body is supposed to be adapting!

Anti-oxidants "absorb" free radicals, neutralizing their effect in the body before their damage to muscle tissue can amount to much. A diet consistently rich in fruits (and other colorful foods, such as VEGETABLES) is apt to keep the body consistently supplied with anti-oxidants, which will assist the body in keeping free radical formation to a minimum. This is a good reason to eat lots of colorful foods during the recovery time between workouts.

Colorful foods include, but are not limited to

Apples, Strawberries, Blueberries, Bananas, Oranges, Kiwi, Watermelon, Raspberries, Grapes, Mango, Papaya, Apricots, Red peppers, Broccoli, Corn, Squash, Carrots, Peas, Green beans, Tomatoes

Colorful foods DO NOT include: Skittles, Jelly Beans, M&Ms, Mike&Ikes, Fruit Loops, etc

Each of these items in the table represents the approximate size of a serving for various foods.

Item	Serving it Represents
Tennis ball	1 cup of cooked rice; 15 grapes
Baseball	12 oz potato; 1 cup of cold cereal
Deck of cards	3 oz cut of meat
Book of matches	1 tbsp of oil, salad dressing or mayo
CD case	1 slice of bread

1" wooden cube	1 oz of cheese
Nickel	2 oz of dry spaghetti, 1 cup of cooked spaghetti

EFFECT of INCREASING DEHYDRATION on PHYSICAL PERFORMANCE

<u>Body Water Loss</u>	<u>Effects</u>
0.5%	Increased Strain on Heart
1.0%	Reduced Aerobic Endurance
3.0%	Reduced Muscular Endurance
4.0%	Reduced Muscular Strength; Reduced Fine
Motor Skills;	Heat Cramps
5.0%	Heat Exhaustion; Cramping; Fatigue; Reduced Mental Capacity
6.0%	Physical Exhaustion; Heatstroke; Coma

PERFORMANCE NUTRITION

TIME	NUTRIENT OBJECTIVES	IDEAL COMPOSITION
30 Minutes Carbohydrate: Before 26 grams Exercise (Food and mg Water or IU Sports Drink) mg mg 120 mg	** Fully hydrate ** Raise blood glucose levels	High-glycemic 20 - Whey Protein: 5 -6 g Vitamin C: 30 - 120 Vitamin E: 20 - 60 Sodium: 100 - 250 Potassium: 60 - 120 Magnesium: 60 -
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During glycemic Carbohydrate: Exercise (Sports Drink) Protein: 5 -6 g - 120 mg 20 - 60 IU mg mg 120 mg	** Replace fluids and electrolytes ** Preserve muscle glycogen ** Maintain blood glucose levels ** Minimize cortisol increases ** Set the stage for a faster recovery	High- 20 - 26 grams Whey Vitamin C: 30 Vitamin E: Sodium: 100 - 250 Potassium: 60 - 120 Magnesium: 60 -
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Within 15 minutes Carbohydrate: After Exercise 50 - 60 g (Sports Drink or 12.5 - 15 g	** Shift the metabolic machinery into a muscle- building state from a muscle-depleting state	High-glycemic Whey Protein:

Recovery Drink)	** Replenish muscle glycogen stores	
Glutamine: 1 - 2 g		
60 - 120 mg	** Initiate tissue repair and set the	Vitamin C:
80 - 200 IU	the stage for muscle growth	Vitamin E:
- 200 mg	** Reduce muscle damage and	Sodium: 100
60 - 100 mg	support the immune system	Potassium:
60 - 120 mg	** Start the replenishment of	Magnesium:
	fluid and electrolytes	

COMPARISON OF BEVERAGES USED POSTEXERCISE

Functional Activity	H2O	Cho/Elec	Pro	Cho/Pro/Elec
Restore Fluids	X	X	X	X
Restore electrolytes		X		X
Replenish glycogen		X		XX
Stimulate protein synthesis		X	XX	XXX
Increase amino acid transport				X
XX				
Prevent protein degradation		X		XX
Blunt cortisol		X		X
Maintain glutamine levels			X	
XX				
Stimulate insulin		XX	X	
XXX				
Support immune function		X	X	XX
Reduce muscle damage		X	X	
XX				

Know the Scoop on Cereals.

For swimmers, cereal is great just about any time of the day. Competitive athletes are encouraged to choose nutrient dense cereals, which contain more of the right kinds of nutrients (carbohydrate, protein, vitamins, minerals) per serving than their "candy cereal" counterparts. More bang for the buck, so to speak.

Generally speaking, the best cereals are high-carbohydrate (>25 grams/serving), moderate-protein (5-10 grams/serving), low-fat (<5 grams/serving), and moderate-fiber (2-4 grams/serving). Most cereals on the market today, including "candy cereal," are fortified with vitamins and minerals, such that one serving usually provides 20-100% of a given vitamin or mineral. However, these values are based on a 2,000 calorie diet, which is well below the energy requirements for most competitive swimmers in their teens and twenties.

Consider cereals in three categories: High Nutrient Density, Moderate Nutrient Density, and Low Density (aka "candy cereal"). Athletes looking for a good cereal but not a whole lot of calories, a Moderate Nutrient Density product is best. For those looking for density (i.e. lots more nutrients/calories in a smaller serving), then a High Nutrient Density cereal is the way to go. Swimmers looking for "candy cereal" should be encouraged to save this type of product for weekends and/or limited occasions. The following table offers a non-exhaustive list of cereals in each of the categories mentioned above:

High Nutrient Density Cereals >30 grams carb >4 grams protein <40% of carbohydrate is sugar	Moderate Nutrient Density Cereals 20-30 grams carbohydrate 2-4 grams protein <40% of carbohydrate is sugar	Low Nutrient Density ("candy") Cereals >40% of carbohydrate is sugar
Quaker Toasted Oatmeal Raisin Bran Smart Start Blueberry Morning Basic Four Wheaties Energy Crunch Raisin Nut Bran Honey Nut Shredded Wheat	Cheerios Team Cheerios Rice Crispies Corn Flakes Special K Total	Fruit Loops Cinnamon Toast Crunch Captain Crunch Cocoa Puffs Fruitie Pebbles Frosted Flakes

And of course, hot oatmeal and granola are always excellent choices. And all dry cereals make a great snack to take on the road. Just toss 1 cup into a plastic storage bag or air-tight container, and off you go. The point is to find a cereal that tastes good and also meets your nutritional needs. With all the products on the market, no swimmer should have any problem doing just that.

Nutrition On Deck: PACKING FOR MEETS

Given the hectic pace of meet day, swimmers should have a variety of food items to select from. Send them to the pool with a cooler of goods. Use the following suggestions to get you started:

Foods:

- § Dry cereal (ex: Frosted Mini Wheats, Honey Nut Shredded Wheat)
- § PBJ sandwich halves
- § Granola bars
- § Power Bars
- § 100% Juice boxes
- § Whole fruits (ex: orange, peach, nectarine)
- § Container of berries (ex: strawberries, raspberries, blackberries)
- § Yogurt w/ side of granola cereal for mixing
- § Individual packets of oatmeal
- § Trail mix (nuts, raisins, dried cranberries, mini pretzels, chocolate chips or M&Ms)
- § Water
- § Electrolyte drink (ex: Acclerade, Gatorade)

Tips:

- § Pack things in small servings.
- § Think finger food.
- § Include an ice pack.
- § Include enough variety for selection based on on-the-spot preference.
- § Include things you know they like and are likely to eat.
- § Avoid things you know they won't eat.
- § Provide utensils.
- § Avoid items that require cutting (cut it at home!).
- § Don't require them to bring to cooler home empty. Use this to see what they eat and don't eat.

Nutrition On Deck: CONCESSION STANDS

Concession stands are a great fundraising method at meets and other club-organized events. The challenge is in providing food items that are both nutritious AND good sellers. Consider the following next time you organize a concession stand for your club:

Sandwiches – Submarine sandwiches, turkey sandwiches, ham and cheese sandwiches...Cut them into halves and provide the condiments separately. In fact, keep the condiments behind the counter, and distribute upon request. Be sure the sandwiches are kept chilled.

Pizza - Everyone likes pizza, so this should be a good seller. Provide pizza by the slice, and consider cheese pizza and veggie pizza options over meat pizzas. Pizza is a more nutritious option for the swimmers relative to chili dogs and nachos.

Snacks - . Consider individually packaged snacks, and recruit volunteers to spend the evening before packing Ziplocs with dry cereal and trail mix. Also consider granola bars, PowerBars, PowerBar Bites, yogurts with individual packs of granola/granola, oatmeal packets, and even popcorn. These are all great substitutes for candy!

Fruit and Veggie Snacks - Although fruits and veggies would fit in the category of

snacks, these snacks are worthy of its own category. Whole fruits are easy, but think color...oranges, peaches, nectarines, strawberries, watermelon, grapes. Consider individual half-cup containers of blueberries, raspberries, blackberries or mixtures to sell as an option with the yogurts (i.e. pick fruit or grapenuts/granola or both).

Veggies can be more difficult, so again be sure only to sell what people are likely to buy. Baby carrots, sugar peas, and celery sticks with peanut butter or ranch dip are typically better sellers than raw broccoli or cauliflower.

Drinks - The biggest decision regarding drinks at concessions stands seems to be whether or not to offer soda. Keep in mind that relative to juice boxes, electrolyte drinks such as Gatorade and Powerade and nutrition drinks like Carnation Instant Breakfast, soda provides little nutritional value. Because soda can be a big seller, consider limiting soda sales to non-swimmers at meets.

Nutrition On Deck: ROAD TRIPS

Eating on the road with your team is a part of the sport. Make the most of your road trip by considering the following tips:

Tips for Eating Breakfast on the Road:

- Order pancakes, waffles, French toast, bagels, cereal, English muffins, fruit or juice. These foods are all high in carbohydrates.
- Avoid high-fat choices such as bacon, sausage or biscuits and gravy.
- Pack containers of dry cereal, crackers, juice or dried fruit such as raisins and apricots; or pack fresh fruits such as apples or oranges in case the restaurant does not provide these items.
- If you eat breakfast at a fast food restaurant choose foods like cereal, fruit juice and muffins or pancakes instead of breakfast sandwiches.

Tips for Eating Lunch and Dinner on the Road:

- Try restaurants that offer pastas, breads and salads.
- Order thick crust rather than thin crust pizza for more carbohydrates.
- Order vegetables such as mushrooms and green peppers on the pizza. Avoid high fat toppings such as pepperoni and sausage.
- Order vegetable soups accompanied by crackers, bread, or muffins.
- Emphasize the bread in sandwiches, not the filling, mayonnaise or potato chips.
- Avoid deep fat fried foods such as French fries, fried fish and fried chicken.
- Choose low-fat milk or fruit juices rather than soda pop.