

## The Basic Nutrients are:



## The Energy-Yielding Nutrients:

### Carbohydrate

*The primary energy source  
for swimmers.*



### Protein

*Used primarily to build cells.*

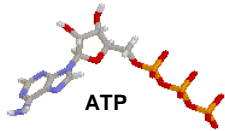
### Fat

*Another energy source.*

They all provide  
energy in the  
form of calories.

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Calories ... .. Energy ... .. Exercise



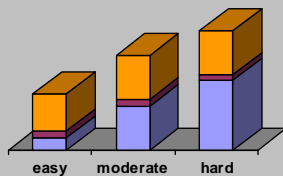
<b>Carbohydrate</b>	<b>4 kcal/gram</b>
<b>Protein</b>	<b>4 kcal/gram</b>
<b>Fat</b>	<b>9 kcal/gram</b>

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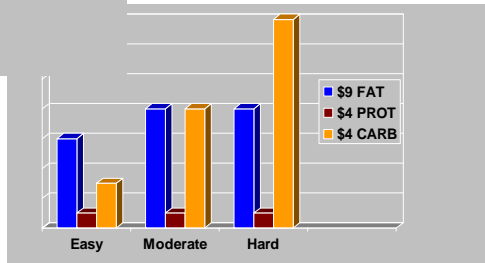
The Energy "CO\$" of Swimming



Figure 1. Fuel Sources During Swimming.



\$9-fat  
\$4-prot  
\$4-carb



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# What are Carbohydrates?

## The primary fuel source for swimmers!

Carbohydrates are **NOT** fattening.

They get used for *energy*, leaving little to be converted to body fat.



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## Individual Carbohydrate Requirements

*6-10 grams per kg of body weight per day*



Body Weight (lbs): \_\_\_\_\_ lbs

kg = lbs / 2.2: \_\_\_\_\_ lbs / 2.2 = \_\_\_\_\_ kg

Carbohydrate:

Daily Requirement:

Low end (easy days) = \_\_\_\_\_ kg x 6 = \_\_\_\_\_ grams

High end (hard days) = \_\_\_\_\_ kg x 10 = \_\_\_\_\_ grams

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## Glycemic Index (GI)

- Developed to help diabetics control their blood sugar.
- Represents a carb's effect on blood sugar.
- Reflects a food's ability to contribute glucose to the bloodstream...Low = Slow.
- Influenced by amount eaten, fiber content, amount of added fat, food preparation.

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## Glycemic Index (GI)

(based on 50g)

### High-GI Carbs (GI >60)

- enter bloodstream quickly
- best for during and after exercise

#### **Examples:**

Gatorade, baked potato, corn flakes, bread, graham crackers, honey

### Low-GI Carbs (GI <40)

- enter bloodstream slowly
- best for pre-exercise meals or snacks

#### **Examples:**

Power bar, apple, milk, fruit yogurt, dried apricots, underripe banana

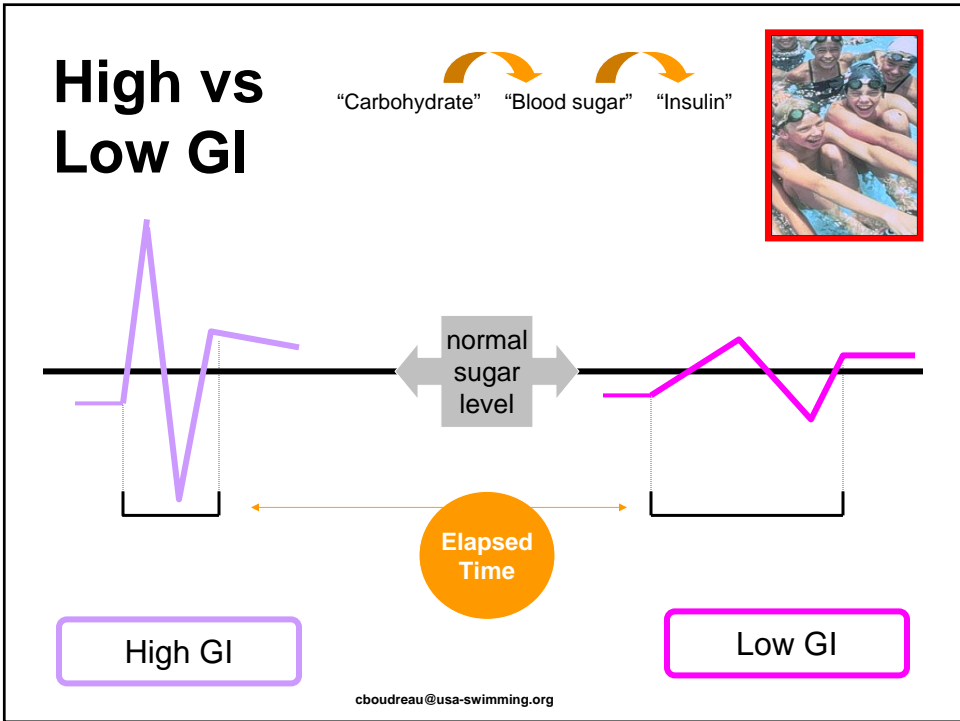
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GLYCEMIC INDEXES OF SOME COMMON FOODS			
<b>Breads and Grains</b>			
Waffle	76	<b>Fruits</b>	
Doughnut	76	Watermelon	72
Bagel	72	Pineapple	66
Bread, white	70	Raisins	64
Bread, whole wheat	69	Banana	53
Cornmeal	68	Grapes	52
Bran Muffin	60	Orange	43
Rice, white	56	Pear	36
Rice, instant	91	Apple	36
Rice, brown	55		
Bulgur	48	<b>Starchy Vegetables</b>	
Spaghetti, white	41	Potato, baked	83
spaghetti, whole wheat	37	Potato, instant	83
Wheat Kernels	41	Potato, mashed	73
Barley	25	Carrots	71
		Sweet Potato	54
		Green Peas	48
<b>Cereals</b>			
Rice Krispies	82	<b>Legumes</b>	
Grape Nut Flakes	80	Baked Beans	48
Corn Flakes	77	Chick Peas	33
Cheerios	74	Butter Beans	31
Shredded Wheat	69	Lentils	29
Grape Nuts	67	Kidney Beans	27
Life	66	Soy Beans	18
Oatmeal	61		
All Bran	42		
<b>Dairy</b>			
Ice Cream	61		
Yogurt, sweetened	33		
Milk, whole	27		
Milk, skim	32		
		<b>Snacks</b>	
		Rice Cakes	82
		Jelly Beans	80
		Graham Crackers	74
		Corn Chips	73
		Life Savers	70
		Angel Food Cake	67
		Wheat Crackers	67
		Popcorn	55
		Oatmeal Cookies	55
		Potato Chips	54
		Chocolate	49
		Banana Cake	47
		Peanuts	14
		<b>Sugars</b>	
		Honey	73
		Sucrose	65
		Lactose	46
		Fructose	23
		<b>Beverages</b>	
		Soft Drinks, regular	68
		Orange Juice	57
		Apple Juice	41

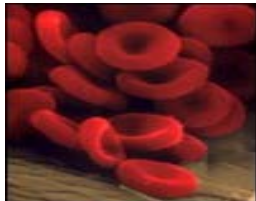
*Glycemic Index was calculated using glucose as the reference, with a GI of 100. Data from Foster-Powell and Brand Miller (1995).*

*Table reproduced by Walberg Rankin, J. (1997). Gatorade Sports Science Exchange 26(1).*

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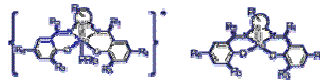


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## What about Protein?

- Protein builds and repairs muscle.
- Protein produces hormones.
- Protein supports the immune system.
- Protein replaces red blood cells.



Protein provides energy only when other sources are no longer available (starvation, malnutrition).

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## What About Extra Protein?

- ...“Most athletes do not need ‘extra’ protein, but should focus on the timing of nutrient ingestion.”
- ...Post-exercise CHO reduces protein breakdown.
- ...Protein post-ex optimizes anabolic response.
- ...Pulse the system.
- ...Essentials better than mixed.
- ...Start IMMEDIATELY! ... ACTIVE recovery!
- ...Source has minimal effect.

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## What about *extra* Protein?



Extra protein does not build muscle bulk...exercise does.



Your need is based on body weight and current training intensity.

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## Individual Protein Requirements

*1.4-1.8 grams per kg of body weight per day*



Body Weight (lbs): \_\_\_\_\_ lbs

kg = lbs / 2.2: \_\_\_\_\_ lbs / 2.2 = \_\_\_\_\_ kg

Protein:

Daily Requirement:

Low end (easy days) = \_\_\_\_\_ kg x 1.4 = \_\_\_\_\_ grams

High end (hard days) = \_\_\_\_\_ kg x 1.8 = \_\_\_\_\_ grams

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## What about Fat?

Our ability to make certain fats limits our requirement to consume them.

- Fats are also known as "Lipids."
- Fat is a substance in many hormones.
- Fat helps control satiety (fullness after eating).
- Fat stores our fat-soluble vitamins (A, D, E, K).
- Fats deliver our *essential fatty acids*.



*Fat supplies the fuel for low-intensity exercise.*

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## I need Fat, but...

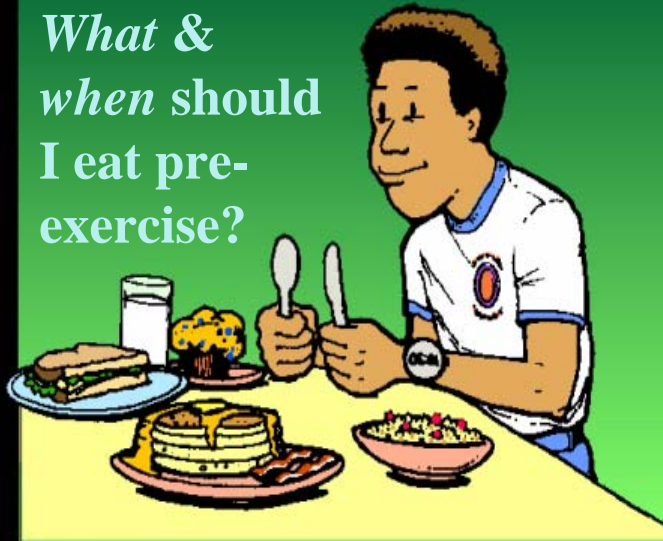
***Limit Fat intake to 25% of total calories.***

Trade high-fat foods for low-fat substitutes:

- *lean cuts of meat instead of meat with visible fat*
- *angel food cake instead of chocolate cake*
- *frozen yogurt instead of ice cream*
- *low fat salad dressing instead of regular*
- *2% or skim milk instead of whole milk*
- *baked anything instead of deep-fried!*

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*What &  
when should  
I eat pre-  
exercise?*



Nancy Clark, MS, RD

## Pre-exercise meal timing

Large meal: 4 - 6 hours

Lighter meal: 2 - 3 hours

Snack: .5 - 1 hour

*Timing varies with:*

- Intensity of exercise
- Personal tolerance to food

## Pre-exercise food guidelines

- High carbohydrate
- Low fat
- Moderate protein
- Extra fluids
- Appropriate portions

## The best pre-exercise foods

- Tried-and-true favorites
- Physiologically comfortable
- Psychologically pleasing

# Pre-exercise calorie targets

*Recommended intake:*

Time pre-exercise	1 hour	4 hours
Gm. Carbs / lb	0.5	2.0
Gm carb / 150 lb person	75	300
Calorie targets	300	1,200

*Pre-exercise food feeds the brain & fuels the muscles*

What's good for quick energy  
before exercise...?



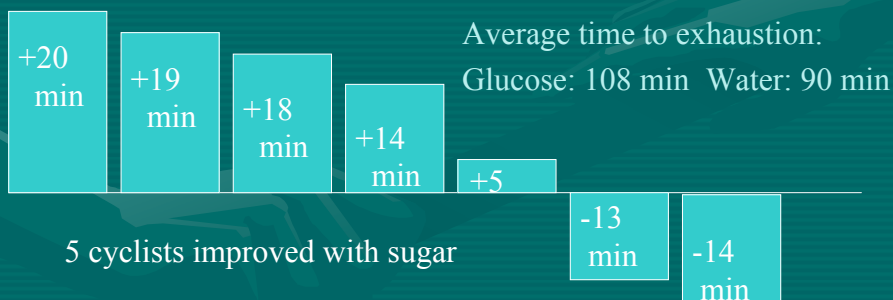
## Pre-exercise sugar

- Generally enhances performance  
(but not health)
- May cause hypoglycemia and needless fatigue if you are “sugar sensitive”

Safest best: *Avoid sweets 15 - 45 minutes pre-exercise*

## Sugar: individual responses

- STUDY: 7 cyclists consumed 300 calories\* sugar OR plain water 1 hour pre-exercise
- RESULTS: 7 individual responses in performance



\*1 gm glucose/kg body wt

## CHO GUIDELINES DURING EXERCISE

- 4-6 oz. of fluid
- Every 15-20 minutes
- 30-60 gm/CHO/hr

## Digestion during exercise

Gastric emptying during moderate to hard\* exercise is similar to at rest.

- Cyclists burned 300 of the 400 calories they consumed during three hours of moderately hard biking.
- When athletes consumed 280 calories of sports drink during 50 min. of hard exercise followed by a sprint to the finish, their sprint performance improved 12%.

\*70-80% VO<sub>2</sub> max

## Carbs during exercise: Solid food *vs* fluids

*STUDY: Athletes ate no food for at least 6 hours, then exercised moderately-hard for 2 hours*

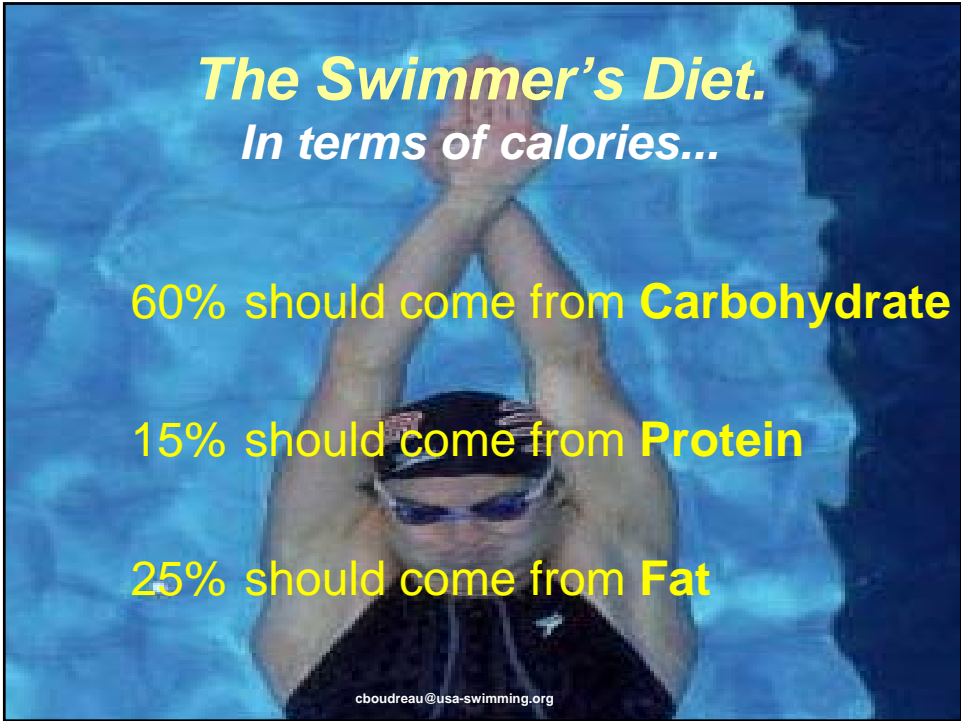
- Every 30 minutes they consumed 100 calories of
  - Sports drink (liquid carbs)
  - Energy bar (solid carbs)
- No differences in blood glucose during exercise

## Quick energy during exercise

*For exercise, maintain blood glucose with—*

- Sports drinks
- Diluted juices (1/2 strength)
- Energy bar + water
- Fruit, hard candies + water

*Target 100 - 300 calories of carbs/hour, after the first hour*

A photograph of a swimmer in a pool, viewed from above, with arms raised. The swimmer is wearing a black cap and goggles. The water is blue and rippling. Overlaid on the image is yellow text.

***The Swimmer's Diet.***  
***In terms of calories...***

60% should come from **Carbohydrate**

15% should come from **Protein**

25% should come from **Fat**

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A solid blue rectangular area with a red border. Inside the border, the text is centered and reads:

**The**  
**Importance**  
**of**

**TIMING**

**and**

**RECOVERY**

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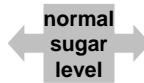
# Nutrition Foundations...



**Eat a Variety of Foods from all Food Groups.**



**Eat Colorful Foods...Including Recovery.**



**Eat Early and Often...Including Recovery.**

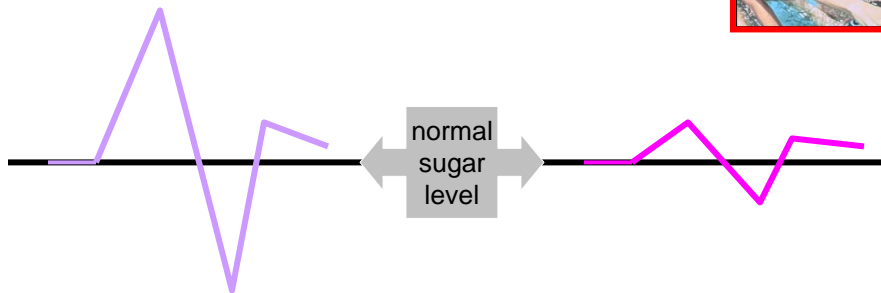
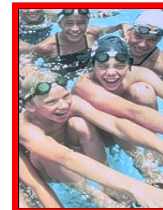


**Drink Early and Often...Including Recovery.**

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## Eat Early and Often

“Carbohydrate” “Blood sugar” “Insulin”



**Bigger Meals  
(3 per day)  
Insulin Spikes**

**Smaller Meals  
(5-6 per day)  
Insulin Steady**

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## About Glycogen Storage...

- There is a limit to the amount of glycogen that can be stored at one time.
- Remaining blood sugar may be stored as fat.
- A good reason to eat smaller amounts of carbohydrate at more frequent intervals.
- A good reason to eat high-carbohydrate foods that also contain some protein, fat and/or fiber (each of these lessens the glycemic response).
- The exception to this storage limitation is the two hours immediately following a tough workout.

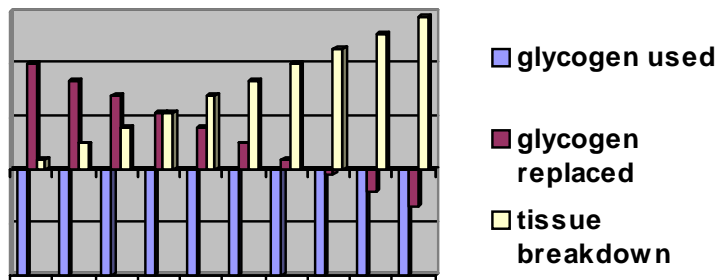
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## Glycogen and Recovery

*Coaches Quarterly 10(1), Spring 2004*

**Figure 2. Long-term failure to replace glycogen leads to tissue breakdown.**



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## Poor Nutritional Recovery

### Training (chronic/long-term)

- “lead legs”
- “can’t keep up”
- elevated resting HR
- elevated HR on typical sets

### Racing (acute/immediate)

(usually on back end of meet)

- lower post-race peak lactate
- diminished recovery
- feelings of fatigue
- elevated resting HR
- longer post-race HR recovery

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## Good Nutritional Recovery

Maintains energy. ~ Limits tissue breakdown.  
Especially during periods of high volume/high intensity.

### Training

**Start the replenishment process IMMEDIATELY!** The “window of opportunity” for maximizing glycogen repletion starts to close as soon as exercise stops...it lasts for about 2 hours.

**1.2-1.5 g/kg/hr for up to 5 hrs post-workout**

### Racing

**Eat a high-carb/moderate-protein snack IMMEDIATELY** after your PRELIMS race and immediately after your FINALS race, then again after warm-down.

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## Individual Requirements

First, covert your weight to kg: \_\_\_\_\_ lbs / 2.2 = \_\_\_\_\_ kg

	Low 6 g/kg-carb 1.4 g/kg-prot	High 10 g/kg-carb 1.8 g/kg-prot	Recovery 1.0 g/kg-carb for up to 3 hrs	Foods:
Carb total			---	
Carb recovery	---	---		
Carb remainder			---	
Protein total			---	

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## Example:

140 lbs / 2.2 = 63.6 kg

	Low 6 g/kg-carb 1.4 g/kg-prot	High 10 g/kg-carb 1.8 g/kg-prot	Recovery 1.0 g/kg/hr-carb for up to 3 hrs	Foods:
Carb total	382	636	---	
Carb recovery	---	---	64	
Carb remainder	318 (382 – 64)	508 (636 – 128)	---	
Protein total	89	114	---	

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Eat ONE of the following immediately after workout or racing, then another item an hour later:

Body Weight (lbs)	Carbohydrate Required to meet 1.2 g/kg	DRINK Examples (good anytime, but particularly for race days)	BAR Examples (good anytime, but particularly for race days)	OTHER Food Examples (good anytime, but particularly for home training days)
120-150	65-85 grams	35-50 oz Gatorade® OR 35-50 oz Powerade® OR 2 cans Carnation Instant Breakfast™ OR 1.5 cans Boost® OR 1.5 cans Ensure™	1.5 PowerBars® OR 1.5 PowerBar Harvest® bars OR 1.5 Cliff® bars OR 2 50g pkgs PowerBar® Bites	2 cups apple juice* or cranberry cocktail* OR 2 servings of low-fat yogurt OR 1 cup dried apricots OR 1.5 PBJ sandwich
160-200	85-110 grams	50-65 oz Gatorade® OR 50-65 oz Powerade® OR 2.5 cans Carnation Instant Breakfast™ OR 2.5 cans Boost® OR 2.5 cans Ensure™	2 PowerBars® OR 2 PowerBar Harvest® bars OR 2 Cliff® bars OR 3 50g pkgs PowerBar® Bites	2/3 cup raisins* OR 4 cups grapefruit juice* or orange juice* OR 2 medium bagels OR 4 slices watermelon* OR 1 bagel with peanut butter OR 2.5 cans Ensure™
>200	115+ grams	65+ oz Gatorade® OR 65+ oz Powerade® OR 3 cans Carnation Instant Breakfast™ OR 3 cans Boost® OR 3 cans Ensure™	2.5 PowerBars® OR 2.5 PowerBar Harvest® bars OR 2.5 Cliff® bars OR 3.5 50g pkgs PowerBar® Bites	8 kiwi fruits* OR 2 cups canned fruit salad* OR 2 PBJ sandwich plus 1 serving yogurt

(\*indicates carb-only food)

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### Recovery Foods Comparison Chart

Food Item	Amount	Carbohydrate (g)	Protein (g)	Ratio CHO:Prot	Fat (g)	Calories (Kcal)	Vit A (ugRE)	Vit C (mg)	Vit E (mg aTE)	Sodium (mg)	Potassium (mg)				
Solid Foods	Bagel w/ Peanut butter	1w/ 2 tbsp	49	16	3.1	17	399	0	0	3	558	345			
	Yogurt w/ Grapenuts	8oz w/ 1/2 cup	58	13	4.5	4	309	0	2	0	242	556			
	PBJ (w white bread)	1 sandwich	44	12	3.7	18	375	0	1.5	3	415	287			
	PBJ (w heat bread)	1 sandwich	46	13	3.5	18	384	0	1.5	3.5	451	370			
	PowerBar (basic)	1 bar (65 g)	45	10	4.5	2	230	0	60	9	90	150			
	PowerBar Bites	1 bag (50 g)	32	8	4.0	5	200	0	54	9	190	160			
	Clif Bar (non-iced)	1 bar (68 g)	48	8	6.0	3.5	230	333	60	10	110	210			
Liquid Nutrition	Milk (2%)	8oz	12	8	1.5	5	122	0	2.4	0.2	122	376	Milk-based	lactose	casein
	Milk w/ Chocolate Syrup	8oz w/ 2 tbsp	24	9	2.7	5	172	0	2.4	0.2	170	407	Milk-based	lactose, sucrose	casein
	Carnation Instant Breakfast	1 can (10 fl oz)	37	12	3.1	2.5	220	450	30	2.5	230	610	Milk-based	lactose, sucrose	milk
	Boost	1 can (8 fl oz)	41	10	4.1	4	240	250	60	10	130	400	Lactose-free	sucrose, fructose	milk
	Ensure	1 can (8 fl oz)	40	9	4.4	6	250	250	30	2.5	200	370	Lactose-free	sucrose, fructose	soy, whey, milk
	SlimFast	1 can (11 fl oz)	40	10	4.0	3	220	350	60	10	220	600	Milk-based	sucrose, fructose	milk
	Gatorade Nutrition Shake	1 can (11 fl oz)	54	20	2.7	8	370	?	?	?	280	560	?	??	??

VitA, VitC, VitE values based on 1997-1998 Dietary Reference Intakes (DRIs) for Adult Males  
(Vit A 1000 ug RE, Vit C 60 mg, Vit E 10 mg aTE)

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## Recovery Tips

### Training

- Bring your post-workout or post-race snack to the pool.
- If you have a long drive home after training, eat in the car and then have a decent meal when you get home.
- If you live close to the pool, you should have it ready right after practice to eat on the way home or as soon as you walk in the door.

### Racing

- If you're at prelims, eat at least half of your post-race snack before getting in the water for warm-down. Eat the other half, plus another snack when you finish warming down.
- Solid foods are great, but liquid nutrition (ex. Instant Breakfast, homemade smoothies) may be more tolerable and easier to incorporate into a warm-down.

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## Recovery Summary

- Training when recovered is (+) stress.
- Training when tired is (-) stress.
- Glycogen resynthesis takes 24 hours.
- Get back to basics:

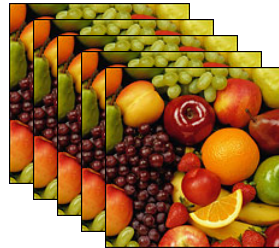
- ❖ CHO
- ❖ Protein
- ❖ Water
- ❖ Salt

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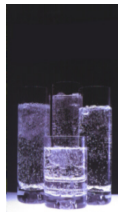
# Color – Eat Colorful Foods.

-  Vitamins
-  Minerals
-  Antioxidants
-  Free Radicals\*
-  Carbohydrate
-  Recovery
-  Health



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## Drink Early and Often



*Weight loss of 2% can impair performance.*

**IF YOU'RE THIRSTY, IT'S TOO LATE!**

Sports Drinks?



Ok, IF 6-8% carbohydrate.

**Check your hydration status:**

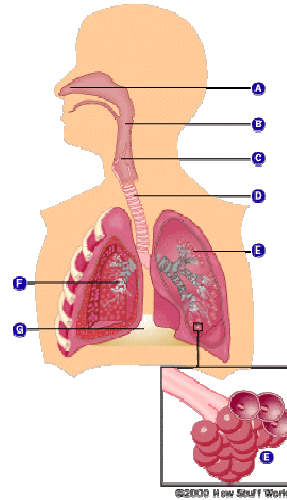
Dark Gold=Drink More!  
Pale Yellow=Good Job!



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## The Thirst Mechanism...

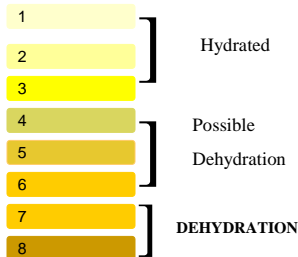
- Thirst is not always an accurate indicator of when an athlete should *begin* hydrating.
- Thirsty = already dehydrated.
- Make the intake of fluids, including sports drinks, an important part of the daily nutrition program, especially during the recovery phase.
- Fluids containing sodium may be more efficient at hydrating than plain water alone.
- “one should consume adequate fluids during the 24-hour period before an event and drink about 500 ml (about 17 oz) of fluid about 2 hours before exercise to promote adequate hydration and allow time for excretion of excess ingested water.” (ACSM)



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## Athlete Wallet Card...aka The “P” Card

### Armstrong Urine Color Chart



Collect sample in clear plastic container.  
Hold up to bright light for comparison.

The urine color chart is reproduced with permission from Lawrence Armstrong and Human Kinetics and was originally published in Lawrence Armstrong's book titled *Performing in Extreme Environments*. The book may be purchased from Human Kinetics by calling 800-747-4457 or online at [www.humankinetics.com](http://www.humankinetics.com).

### GENERAL FLUID RECOMMENDATIONS

- **Training/Competition of less than 1 hour**  
Pre: 1 x 8-10 oz of CHO-E  
During/After: 2 x 8-10 oz of Water or CHO-E
- **Training/Competition between 1 to 3 hours**  
Pre: 1 x 8-10 oz of CHO-E (30-60 min pre)  
During: 1 x 8-10 oz per hour of CHO-E  
After: 1 x 8-10 oz of CHO-E (every 30 min. for 2 hrs)

CHO-E = Carbohydrate-Electrolyte drink (eg., Powerade)

17°C = 63°F  
25°C = 77°F  
32°C = 90°F  
40°C = 104°F



**CARB Sources** - bread, granola, potato, rice, pasta, fruit, yogurt, juice, Powerade, corn, squash, raisins

**PROTEIN Sources** - chicken, meat, fish, cheese, yogurt, tofu, nuts, beans, hummus, peanut butter, beans, eggs, milk, lentils

**IRON Sources** - beef, shrimp, spinach, tofu, whole grains, peas, beans, cereal

**ANTIOXIDANT Sources** - berries, broccoli, carrots, spinach, kale, apricots, cantaloupe, peanuts, almonds, seeds, tuna, eggs, garlic

**SODIUM Sources** - salted pretzels, Gatorade, table salt

When traveling internationally **AVOID** - raw fish, tap water, condiments, meat that is not cooked and hot

## Hyponatremia

over-drinking + salt loss

## Symptoms of Hyponatremia

At meets, athletes should:

- Be aware of urine output
- Limit sun exposure
- Ensure adequate Na intake
- Drinks in addition to water
- Be aware of excessive and/or salty sweating
- Be aware of symptoms

- Lightheadedness
- Yawning
- Headache
- “drunk”, goofy
- Vomiting
- Nausea
- Combative
- Delirious
- Muscle spasms

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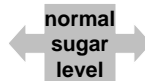
## Back to the Big Picture: Nutrition Foundations...



**Eat a Variety of Foods from all Food Groups.**



**Eat Colorful Foods...Including *Recovery*.**



**Eat Early and Often...Including *Recovery*.**



**Drink Early and Often...Including *Recovery*.**

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## The 25 Best Foods for Fitness

When it comes to choosing the foods we eat, we have so many choices that it often becomes confusing. As Americans, we are blessed with almost every kind of food imaginable, available right next door at the supermarket. There are, however, some very specific foods that help improve athletic performance. The foods listed below are particular important to keep in your diet. The following foods, in alphabetical order, provide premium fuel for the active athlete.

### **Banana**

The perfect portable snack. They're one of the richest sources of potassium, which may help regulate blood pressure, and are good sources of fiber. Frozen banana chunks make a terrific guilt-free snack.

Bananas are also a natural antacid and help keep your muscles from cramping.

*1 banana = 105 calories, 0.5 g fat, 27 g carbohydrate, 1.2 g protein, 1 mg sodium, 0 mg cholesterol, 2.2 g fiber, 451 mg potassium.*

### **Beef**

Truly lean beef is a great source of zinc, high-quality protein and iron. Choose lean cuts such as shank, round, flank, and chuck and trim all excess fat before cooking. Broil or bake meat on a rack, so meat doesn't cook in its fat.

*3-oz. lean round steak = 163 calories, 5 g fat, 0 g carbohydrate, 27 g protein, 56 mg sodium, 69 mg cholesterol, 0 g fiber, 13% RDA for iron, 32% for zinc, 41% for vitamin B12.*

### **Beans-Legumes**

An excellent source of fiber (important for keeping blood sugar and cholesterol levels under control). In fact, beans provide even more soluble fiber than oats. They're high in protein and a good source of folic acid, a B vitamin important for building protein and red blood cells.

*1/2 cup serving = 112 calories, 0.4 g fat, 21 g carbohydrate, 7.5 g protein, 1 mg sodium, 0 mg cholesterol, 7.7 g fiber, 304 mg potassium, 11% RDA for folic acid.*

### **Broccoli**

A wonder food! - one of the best nutritional bets around. Not only is broccoli high in fiber and vitamin C, it provides folic acid, calcium, magnesium and iron.

*1 cup, cooked = 46 calories, 0.4 g fat, 9 g carbohydrate, 5 g protein, 16 mg sodium, 0 mg cholesterol, 4.8 g fiber, 164% RDA for vitamin C, 42% RDA for vitamin A, 17% for calcium, 24% for folic acid.*

### **Brown Rice**

A good source of complex carbohydrates that provides twice as much fiber as white rice. Moreover, it beats white rice for almost every nutrient, including zinc, magnesium, protein, vitamin B6 and selenium.

*1/2 cup serving = 116 calories, 0.6 g fat, 25 g carbohydrate, 2.5 g protein, 0 mg sodium, 0 mg cholesterol, 0.6 g fiber*

### **Carrot Juice**

Probably the most concentrated source of beta-carotene, which, in addition to its possible role as a cancer fighter, may play a key role in preventing the formation of cataracts later in life. Beta-carotene, a source of Vitamin A, also may boost your immune system's ability to fight bacterial and viral infections.

*1/2 cup serving = 49 calories, 0.2 g fat, 11 g carbohydrate, 1 g protein, 36 mg sodium, 0 mg cholesterol, 1.2 g fiber, about 33% RDA for vitamin A.*

### **Low Fat or Fat Free Cheeses**

Great sources of calcium, but read nutritional labels carefully: Some of these cheeses aren't much lower in fat than their regular counterparts, and they can be high in sodium. Choose one that contains 5 grams or less fat per ounce.

*1 -oz serving Alpine Lace = 85 calories, 5 g fat, 7 g protein, 85 mg sodium, 20 mg cholesterol, 35% RDA for calcium.*

### **Chicken**

Three ounces of skinless chicken breast has only 3 grams of fat and contains vitamin B6, a nutrient important for metabolizing protein. Dark meat has more fat than white, but also more B vitamins, iron, zinc, and other nutrients. Unlike popular belief, skin fat does not "migrate" into the meat, so cook the chicken with the skin on and remove after cooking. This keeps the chicken moist.

*3-oz. Breast, no skin, roasted = 140 calories, 2.9 g fat, 0 g carbohydrates, 26 g protein, 62 mg sodium, 0 g fiber, 58% RDA for niacin, 25 % for vitamin B6.*

### **Corn**

An often-overlooked source of fiber and carbohydrate. Sure, fresh corn tastes best, but frozen or canned alternatives are convenient ways to get additional fiber in your diet. Corn also has almost no fat.

*1/2 cup serving = 67 calories, 0.6 g fat, 17 g carbohydrate, 2.5 g protein, 4 mg sodium, 1.6 g fiber, 17 micrograms folic acid.*

### **Dried Fruit**

Because most of the water has been removed, dried fruits are terrific concentrated sources of energy and good sources of iron - a mineral that helps prevent anemia. High in fructose, they also can be intensely sweet, making them great desserts or snacks - and they're fat free.

*3-oz serving = 203 calories, 0.4 g fat, 53 g carbohydrate, 3.1 g protein, 8.5 mg sodium, 0 mg cholesterol, 6.8 g fiber, 22% RDA for iron, 123% RDA for vitamin A.*

### **Fig Bars**

A favorite among cyclists and runners because they pack a strong carbohydrate punch and are easy to eat during exercise. Much lower in fat than most treats, fig bars also supply a bit of fiber - not a lot, but more than most sweets.

*2 bars = 106 calories, 1.9 g fat, 21 g carbohydrate, 1 g protein, 90 mg sodium, 0 mg cholesterol, 5 g fiber.*

### **Grapes**

Once thought to provide few significant nutrients, now researchers find that grapes are a good source of boron, a mineral believed to be important in building and maintaining healthy bones.

*1/2 cup serving = 29 calories, 0.2 g fat, 1 mg sodium, 0 mg cholesterol, 0.3 g fiber.*

### **Kiwi**

The odd little fruit in the fuzzy brown wrapper proves that good things can come in small, ugly packages. Each kiwi provides 75 mg of vitamin C and 1.7 grams of fiber.

*1 kiwi = 46 calories, 0.3 g fat, 11 g carbohydrate, 0.8 g protein, 4 mg sodium, 0 mg cholesterol, 1.7 g fiber, 124% RDA for vitamin C.*

### **Lentils**

Good sources of protein and complex carbohydrates, lentils also deliver a good amount of iron, particularly if you're limiting your intake of red meat. Lentils are easier to prepare than other legumes because you don't have to soak them overnight before cooking. Great on their own, in soups or as an addition to ground meat.

*1/2 cup serving = 105 calories, 0 g fat, 20 g carbohydrate, 8 g protein, 30 mg sodium, 0 mg cholesterol, 5.2 g fiber, 12 % RDA for iron, 7% for zinc, 9% for folic acid.*

### **Skim Milk**

Skim milk is an excellent low-fat source of calcium and vitamin D - both important for maintaining healthy bones. Research suggests that you have less risk of developing colon cancer with high blood levels of vitamin D than with low levels. But don't turn to supplements for vitamin D: large amounts can be toxic.

*8 oz. = 80 calories, 0.4 g fat, 11 g carbohydrate, 8 g protein, 4 mg. cholesterol, 117 mg sodium, 0 g fiber, 24% RDA for vitamin D, 28% for calcium.*

### **Oatmeal**

A good source of soluble fiber, and then some: In a research study, adding 2 ounces a day of oatmeal to a low-fat diet significantly lowered subjects' blood cholesterol in about four weeks.

*1/2 cup serving = 73 calories, 1.2 g fat, 13 g carbohydrate, 3 g protein, 1 mg sodium, 0 mg cholesterol, 2.7 g fiber.*

### **Orange Juice**

Besides being an excellent source of vitamin C, one 6-ounce glass provides nearly as much potassium as a banana and about 23 percent of the RDA for the sometimes-hard-to-find B vitamin folic acid.

*6 oz. = 76 calories, 0.3 g fat, 15 g carbohydrate, 1 g protein, 1 mg sodium, 0.1 g fiber, 340 mg potassium, 142% RDA for vitamin C, 23% RDA for folic acid.*

### **Papaya**

Papaya is a treasure trove of nutrients. One-half of this exotic fruit provides almost as much potassium as a banana and more than 100% of the RDA for vitamin C. It's also a good source of cancer-fighting beta-carotene.

*1/2 papaya = 59 calories, 0.2 g fat, 15 g carbohydrate, 1 g protein, 4 mg sodium, 0 mg cholesterol, 12.2 g fiber, 395 mg potassium, 158% RDA for vitamin C, about 62% RDA for vitamin A.*

### **Pasta**

Pasta is loaded with complex carbohydrates for long-lasting energy, whether you're an athlete or a couch potato. Enriched pasta also provides iron and the important B vitamins thiamine, niacin and riboflavin.

*1/2 cup serving = 77 calories, 0.3 g fat, 28 g carbohydrate, 5.3 g protein, 0 mg cholesterol, 1 mg sodium, 35% RDA for thiamine, 15% RDA for riboflavin, 15% RDA for niacin, 10% RDA for iron.*

### **Potato**

The potato is probably one of the most underrated foods. Besides being a powerhouse of complex carbohydrates, a 6-ouncer also provides almost twice as much potassium as a banana, just over one-third of the RDA for vitamin C and 66 percent of the RDA for iron. It's also a good source of copper, which most people tend to be short on.

*6-oz, baked, with skin = 337 calories, 0.2 g fat, 78 g carbohydrate, 7 g protein, 35 mg sodium, 0 mg cholesterol, 4 g fiber, 974 g potassium, 38% RDA for vitamin C, 66% RDA for iron, 70% RDA for copper, 56% RDA for vitamin B6.*

### **Salmon**

Salmon is one of the richest sources for omega-3 fatty acids, which may provide some protection against heart disease. Eating salmon or other ocean fish like mackerel, herring or tuna twice a week may be enough for you to reap the health benefits. Fish oil may also fight arthritis, alleviate psoriasis and reduce high blood pressure. Salmon is also an excellent source of selenium, which may play a role in cancer prevention.

*3 oz. cooked = 45 calories, 0.6 g fat, 0 g carbohydrate, 0 g fiber, 40 micrograms selenium, 42% RDA for niacin, 35% RDA for calcium. Most types of salmon provide about 1 g omega-3 fatty acids.*

### **Strawberries**

Sweet, delicious strawberries are excellent sources of vitamin C and fiber. They also contain ellagic acid and beta-carotene, which may prove important in cancer prevention.

*1-cup serving = 45 calories, 0.6 g fat, 11 g carbohydrate, 1 g protein, 2 mg sodium, 0 mg cholesterol, 2.2 g fiber, 141% RDA for vitamin C.*

### **Water**

The most critical nutrient in your body, it's needed for just about everything that happens, and you lose it fast: at least 2 cups daily just exhaling; 10 cups through normal waste and body cooling; 1 to 2 quarts per hour running, biking or working out. Eight glasses a day is enough for sedentary people, but if your physically active, you need more.

*Drink 8 to 20 ounces of water about 15 minutes before working out. If you run, drink at least 2 cups of water for every pound you lose on your course.*

### **Whole-Grain Cereals**

Besides providing lots of complex carbohydrates, they're a great way to get fiber in your diet - a prevention measure that the National Cancer Society strongly recommends. What's more, research suggests that eating a high-fiber cereal at breakfast may curb your appetite at lunch.

*Read the labels: a cereal should contain at least 5 grams of fiber and no more than 1 or 2 grams of fat per serving.*

### **Fat Free Yogurt**

Among the few truly excellent sources of calcium - 452 mg per 8-ounce carton - and riboflavin, yogurt's also a strong source of vitamin B12. Use it to reduce fat in your diet: substitute it for sour cream in casseroles or sauces; mix with herbs for vegetable dip; blend with fruit for a thick drink; stir into soups to make them creamy. Frozen, it's an excellent substitute for ice cream. To cut calories in half in flavored yogurts, choose brands artificially sweetened with NutraSweet.

*8-oz serving, plain = 127 calories, 0.4 g fat, 17 g carbohydrate, 13 g protein, 174 mg sodium, 4 mg cholesterol, 0 g fiber 45% RDA for calcium, 31% for riboflavin, 23% RDA for vitamin B12.*

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