Nutrition for High Performance Swimming©

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What Makes a Great Swimmer?

- Talent
- Practice! Practice! Practice!
- Motivation / Mental Toughness
- Physical fitness
- Nutrition

The **High Performance Swimmers'** Food Guide to Healthy Eating

- The Fundamental Foods
- The High Octane Foods
- The Muscle Building Foods
- The Bone-Building Foods
- The False Start Foods

The Fundamental Foods

- Quite simply the majority of what you eat should be **fruits** and **vegetables**
  - Apples, oranges, bananas, berries, etc. etc. etc
  - Leafy greens i.e. spinach, collard greens, kale, etc.
  - Other vegetables are good too i.e. peppers, cauliflower, green peas, etc.
  - **Juice really does not count** here as a good choice – too many quickly consumed empty calories

The High Octane Foods

- These foods are **carbohydrate dense** – good choices for those times when you are going through heavy training
  - Breads that say **whole grain**
  - Sweet potatoes
  - Steel cut oatmeal for a great breakfast

The Muscle Building Foods

- The key nutrient here is called **protein**
- Swimmers need to have enough but (despite what you might here from the body-building world) too much is no good
  - Fish (like salmon) should be eaten twice / week
  - Nuts – have amazing health benefits
  - Beans / legumes – contain protein & carbohydrate

The Bone Building Foods

- Now is the time to build as strong bones as possible!
- We need to eat enough calcium & vitamin D
- Also get enough **weight-bearing exercise**
  - Milk is our best source of calcium & maybe the only food source of vitamin D (not to mention is also a great source of protein
  - Chocolate milk contains extra sugar which you don't necessarily need
  - Yogurt is a good choice too (I like the Greek version)

The False Start Foods

- Don’t believe what you hear from people who are trying to sell you fancy supplements, shakes, powders, potions, etc
- Though you are unlikely to win because of your nutritional choices at a major competition, **remember bad choices could cause you to lose!!!**
- This is not the time for fast food / junk food

Here’s some more higher level info…

How Much Energy Should a Swimmer Eat?

- Study by Costill (1988):
  - 12 male collegiate swimmers (19 y.o.)
  - Swimming 4266m/day = 1142 Calories
  - Swimming 8970 m/day = 2293 Calories
  - Resting energy expenditure would have been 2374 Calories/day
  - Therefore, daily expenditure = 3516-4667 Calories

How Much Energy Should a Swimmer Eat?

- Study by Trappe (1997):
  - 5 female swimmers on the U.S. National team (average 19 y.o., 65.4 kg)
  - Swam ~17.5 km/day over 5 days
  - No study has done distances this long
  - Daily expenditure = ~5593 Calories

How Much Energy Should a Swimmer Eat?

- Reilley, 1999:
  - Reduce carbs from ~53% to ~39% of energy over 3 days → times worsened
  - Increase from ~53% to ~59% → times improved
- Costill, 1988:
  - 1/3 of swimmers became “chronically fatigued”; these swimmers ate only 5.3 grams of carbs/day compared to 8.2 g/day among the swimmers who were not chronically fatigued.

Carbohydrate Sources

Food	Grams
Bagel, whole wheat	48
Beans, baked (250 mL)	55
Bread, whole wheat (1 slice)	15
Bread, multi-grain (1 slice)	21
Cereal (i.e. 2/3 cup Multi-Grain Cheerios	16
Chocolate milk, 1% (250 mL)	28
English muffin, whole wheat	28
Fruit (nutrition content varies; use typical fruit)	~20
Pasta, whole wheat (i.e. macaroni or spaghetti, 85 grams	62
Rice, brown (250 mL, cooked)	45
Vegetable (nutrition content varies;use typical vegetable	~8

How Much Protein Should a Swimmer Eat?

- Inactive individuals – 0.8 grams/kg/day
- Strength/power athlete – 1.7-1.8 g/kg/day
  - Powerful anabolic stimulus of resistance training + extra amino acids = ↑ muscle growth
- Endurance exerciser - 1.2-1.4 grams/kg/day
  - Amino acids used for energy during training
  - Recovery from muscle damage

Protein Sources

Food	Grams
Chicken or fish, 3.5 oz (~100 grams)	21
Egg, whole	6
Chick peas, 1 cup	13
Beans, baked, 1 cup	16
Lentils, 1 cup	19
Tofu, firm, 80 grams	13
Milk (cow or soy), 1 cup	9
Yogurt, 1 tin	4
Cheese (cheddar), 30 grams	8
Bread, 1 slice	2
Pasta or rice, ½ cup	2

Fluid

- Essential for numerous biological processes
- Not as much heat lost exercising in water as on land
- Requirement for the day ~ 1 mL per Calorie
- Most fluids should be obtained through water

Pre-Exercise Nutrition

- For a “pre-game meal”, or any other dietary technique, to be effective in enhancing exercise performance, a specific limiting factor in the performance of the exercise must be augmented

What Should a Pre-Performance Meal Do?

- Optimize glycogen stores
- Ensure proper hydration
- Leave the athlete neither hungry nor with undigested food in the stomach
- Provide positive psychological reinforcement

What Should a Pre-Performance Meal Be?

- High in carbohydrate
- Moderate in protein
- Low in fat and fibre
- Familiar and well tolerated by the athlete

Recovery Nutrition

- Several studies have found that ingesting carbohydrate during the rest interval between two exercise bouts improves performance in the second bout.
- Carbohydrate can help restore blood glucose levels but may also be used to re-synthesize muscle glycogen

Importance of Timing

- Study by Ivy (1988):
  - Rate of glycogen re-synthesis 3 times faster when eating after exercise as opposed to fasting
  - Waiting 2 hours after exercise to eat produced a re-synthesis rate 45% slower than the rate occurring when eating right after exercise.

“Proper practice in these areas is the key to nutrition for high performance swimming.”

Thank You

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