



# ***Fueling for Open Water***

***Nutrition Strategies for the 10K Race  
with 5K and 7.5K Feeding Stations***



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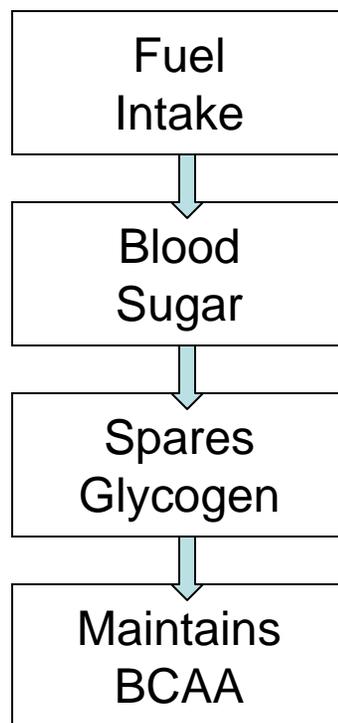
# Physiological and Nutritional Components of Open Water Swimming Determine Feeding Requirements

- Physiological Characteristics:
  - Low anaerobic power.
  - Sustained maximum aerobic capacity.
- Physiological Requirements:
  - Sufficient SUBSTRATE.
  - Sufficient OXYGEN.
- Nutritional Principles:
  - Optimize carbohydrate storage and hydration *before* competition.
  - Sustain carbohydrate delivery and hydration *during* competition.



**FUEL  
&  
FLUID**

# The Mechanism Behind Fueling During Training and Racing



Prevents Central Fatigue



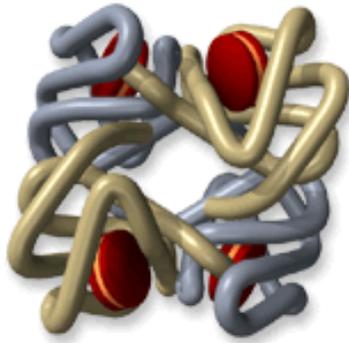
Inhibits Cortisol

## Most Significant Nutrition-Related Challenges



- Inadequate pre-race calories.
- Over-reliance on protein and fat.
- Under-reliance on carbohydrate.
- Poor recovery and use of recovery time.
- Neglect of performance-related vitamins and minerals.
- Failure to strategize and practice feeding.
- Failure to plan daily food intake.
- Failure to take advantage of taper.
- Over-reliance on race day nutrition.
- Under-reliance on training nutrition.

# Iron

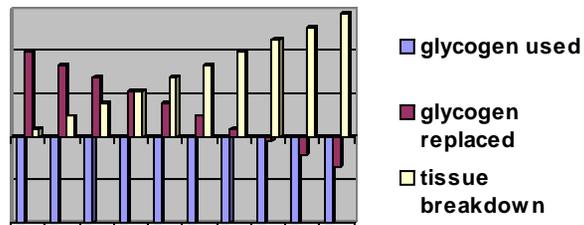


***Lack of body iron can reduce aerobic capacity and impair endurance performance.***

- Ferritin in the 25-35 mg/L range desirable.
- Only go from deficient to sufficient, never over.
- Iron intake 17.5 mg/day (M) and 23 mg/day (F).
- Red meat, dark leafy greens, whole grains, legumes.
- Do not take supplements “just in case”...Always diagnose.

# Recovery

Long-term failure to replace glycogen leads to tissue breakdown.



***How well a swimmer recovers from a workout or race can affect the quality of their next performance.***

- Use insulin response to replenish glycogen.
- Create anabolic environment to limit tissue damage.
- 1<sup>st</sup> priority carbohydrate; 2<sup>nd</sup> priority protein.
- Solid post-workout/race snack within 20-30 minutes.
- Another snack or main meal one hour later (2 feeds/2hrs).

## Other Important Areas and Tips

- Practice Feeding (what, when, how).
- Focus on good nutrition during recovery.
- Use Gatorade during training.
- Train to miss a feeding.
- Protein *supplements* are not necessary.
- Do not depend on dietary supplements.
- Maximize the taper (up carb and fluid).
- Discuss strategy (what, when, how).
- Bring your own products.





## Race Day

### Pre-Race Breakfast, Snacks and Drinks

To hydrate and bring blood sugar levels back up after 8hr fast and MAINTAIN until race.

#### *Snacking and Sipping Strategy:*

1. Eat a high-carb breakfast 90-120 min before race start time.
2. Snack on starchy, low fiber foods (ex. saltines) start.
3. Sip 2-4 oz of water or carb-electrolyte drink every 10-20 min until start.

### Feeding During the Race

***The optimal feeding strategy for any open water race is highly individual and involves the application of sound physiology and nutrition principles combined with race-specific characteristics, such as distance, location, venue/water type, feeding opportunity and swimmer tolerances/preferences.***

## Race Day

10K ~ Fresh Water ~ Warm Climate ~ Feeds 5K, 7.5K

### 5K Feed (~:55)

- Ideally, fluid every 15 min and food every 45 min.
- This course forces a choice at the 5K feeding station.
- More to gain from calories/carbs than fluid at 5K.
- Liquid carb (easy ingestion, digestion, absorption) ideal at 5K.
- Bars, beans, gummies too time-/labor-intensive for this race.
- Gels require water “chase” (and therefore 2 stops).
- Gatorade Performance Series Energy Drink (4 oz) good.
- Gel pack mixed with 4-6 oz water good.
- Hydration, fuel, electrolytes, all-in-one feed, easy to ingest.



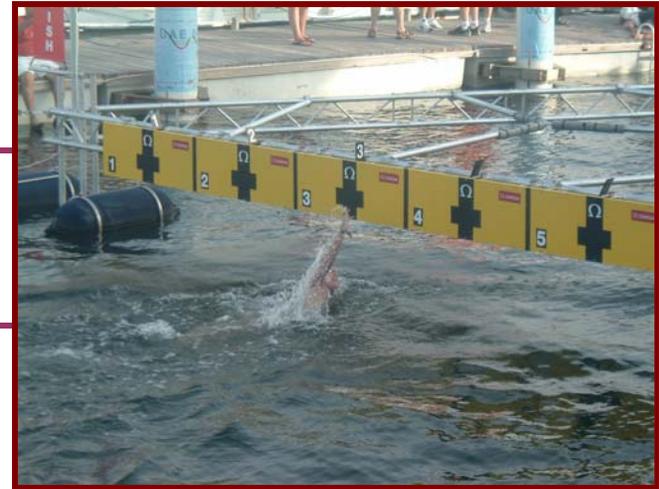
### 7.5 K Feed (~1:25)

- Optional for ~1:50 finishers (25 min to go), but not optional for 2:00+ finishers (>35 min to go).
- Is time worth food, fluid and/or caffeine?
- Skip if fed at 5K AND feeling strong, ready for finish AND expecting ~1:50 AND jockeying for spot.

7.5K Feed Station Scenarios for  
Determining 7.5K Feeding  
Strategy

QUESTION	RESPONSE	RECOMMENDATION for 7.5K
Did I get fuel and fluid at the 5K feeding station?	Yes, got fuel and fluid at 5K	Skipping 7.5K feeding station may be an option.
	No, got only fuel at 5K	Should use 7.5K feeding station for fluid.
	No, missed all feeding at 5K	Skipping 7.5K feeding station is not an option. Get fuel and fluid.
Am I well-positioned now or still jockeying for a spot?	Well-positioned	Skipping 7.5K feeding station may be an option, but consider stopping for fluid.
	Jockeying for spot	Skipping 7.5K feeding station may be an option.
Am I having a good race and feeling strong, or struggling with stamina?	Feeling strong, ready for finish	Skipping 7.5K feeding station may be an option.
	Struggling with stamina	Should use 7.5K feeding station for caffeinated fluid.
Am I on course for a 1:50 finish or closer to 2:00+ hrs?	Expecting a 1:50 finish	Skipping 7.5K feeding station may be an option.
	Expecting a 2:00+ finish	Should use 7.5K feeding station for fuel/fluid.

## The Caffeine Factor



### Spare Glycogen

- Caffeine must be ingested 3-4 hrs prior to start AND
- Must be a deficit in energy stores (i.e. glycogen stores not topped off).
- Insignificant effect if good training nutrition.
- Little to no advantage to including in 5K feeding.

### Stimulant Effect

- During exercise effect.
- May help final leg of 10K.
- Depends on point-in-time tolerance and response.
- Soda is safest source.

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## Water, Air and Feed Temperature

- Cold Water + Cold Air = Warm Feed
- Warm Water + Warm Air = Cool Feed
  
- Stabilize core body temperature.
- Prevent hypo- or hyper-thermia.
- Comforting, refreshing.
  
- To warm, add hot water from thermos.
- Gel pack mixed with hot water is best.
- To cool, chill feed in advance and keep on ice.
  
- Beijing 2008: Regular temp or cool feeds.



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## How to Feed Successfully and Efficiently

- Establish plan for identifying feeder quickly and easily as approaching station.
- Avoid hanging onto feed station, feed pole or person in feed station.
- Use cup when close enough to feeder to be handed cup.
- When not close enough, take cup or pack from feeding stick or pole.
- Stay horizontal.
- Take entire feed!



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

<b>Body Weight (lbs)</b>	<b>Carbohydrate Required to meet 1.2 g/kg</b>	<b>DRINK Examples (good anytime, but particularly for race days)</b>	<b>BAR Examples (good anytime, but particularly for race days)</b>	<b>OTHER Food Examples (good anytime, but particularly for home training days)</b>
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 Clif® 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 Clif® 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 Clif® 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)

Reminder: The values in this table are presented as guidelines only. While replenishing in 30-minute intervals may be a little better in terms of keeping insulin levels elevated, a swimmer will still benefit from taking a “full dose” every hour instead.

<b>Body Weight in lbs (kg)</b>	<b>Carbohydrate Required (g) to meet Intake of 1.2 g/kg</b>	<b>Amount of Common Commercially-Available 6% Carbohydrate Bottled Sports Drink</b>	<b>Food Examples (for every 30 minutes)</b>
120 (54.5)	65 (33 g/30min)	37 oz/hr	1 cup apple juice
130 (59.1)	71 (36 g/30min)	41 oz/hr	1 serving low-fat yogurt
140 (63.6)	76 (38 g/30min)	44 oz/hr	½ cup dried apricots
150 (68.2)	82 (41 g/30min)	47 oz/hr	1 cup cranberry cocktail
160 (72.7)	87 (44 g/30min)	50 oz/hr	1/3 cup raisins
170 (77.3)	93 (47 g/30min)	53 oz/hr	2 cups grapefruit juice
180 (81.8)	98 (49 g/30min)	56 oz/hr	1 medium bagel
190 (86.4)	104 (52 g/30min)	60 oz/hr	2 slices watermelon
200 (90.9)	109 (55 g/30 min)	62 oz/hr	2 cups orange juice
210 (95.5)	115 (58 g/30min)	66 oz/hr	4 kiwi fruits
220 (100.0)	120 (60 g/30 min)	69 oz/hr	1 cup canned fruit salad

Body Weight	Carbohydrate Required to meet Intake of 1.2 g/kg	Amount of Common Commercially-Available 6% Carbohydrate Bottled Sports Drink	Food Examples (per hour)
120-150 lbs	65-85 grams	35-50 oz/hr	2 cups apple juice or cranberry cocktail OR 2 servings of low-fat yogurt OR 1 cup dried apricots OR 2 cans Carnation Instant Breakfast
160-200 lbs	85-110 grams	50-65 oz/hr	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
+200 lbs	115+ grams	65+ oz/hr	8 kiwi fruits OR 2 cups canned fruit salad OR 3 cans SlimFast



# USA Swimming's Position on Dietary Supplements

In an effort to maintain the integrity of our sport and the safety of our athletes, USA Swimming has taken a proactive role in making athletes and coaches more aware of the risks involved in the use of commercially available dietary supplements that have been linked to enhancing performance. Along with the US Anti-Doping Agency (USADA), USA Swimming considers dietary supplements “take at your own risk,” placing full responsibility for any effects and repercussions on the athlete.

It is the role of USA Swimming to educate swimmers, coaches and parents on the issues of dietary supplements, including general and specific risks, normal values and toxicity, drug testing and drug interactions, stacking, and conventional dietary alternatives. It is also the role of USA Swimming to validate or repudiate via research review or sanctioned research the answers to the many questions that surround scientific and anecdotal evidence versus actual application. Any recommendations or opinions offered by USA Swimming regarding the use of dietary supplements are based on a yellow-orange-red light continuum [Health & Contamination Risk Chart for Dietary Supplements](#) and the most current publicly available scientific and consumer-specific information.

Claims made by the manufacturers/ distributors of dietary supplements regarding the effectiveness of their products are not strictly regulated by the US Food and Drug Administration. Any commercial dietary supplement is susceptible to containing substances that may appear on the Prohibited Substance list(s) of FINA and/or the IOC. The potential exists for commercial supplements to contain substances that do not appear on the product's list of ingredients (see [Dietary Supplement Health and Education Act](#) for more information). Statistics indicate that in some cases, the use of legal dietary supplements has been linked to positive test results for prohibited substances in athletics.

The choice to use a dietary supplement is the sole responsibility of the athlete and one that should not be made in haste. An athlete is advised to weigh the options heavily, consider the consequences, and take responsibility for his/her actions.

*July 2003*

## Maughan's Rules on Dietary Supplements for Athletes

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1. If it works, it's probably banned.
2. If it's not banned, then it probably doesn't work.
3. There may be some exceptions.

# Health & Contamination Risk Chart for Dietary Supplements

**WARNING:** Lack of regulation in the supplement industry opens the door for supplement contamination that may result in adverse health effects and/or positive drug tests. Athletes are subject to sanctions even if a positive test is the result of a contaminated supplement.



Lower risk of adverse health effects and/or contamination.\*

Major Brands\*\* of Basic Multi-vitamins or Iron pills or carbohydrate-electrolyte drinks or nutritional bars

\*\*"Major Brands" means reputable well-established companies that do not also make products containing prohibited substances.

\*Lower risk does not equal "zero" risk. There is evidence linking various **YELLOW** and **ORANGE** risk products to positive doping results.



Increased risk of adverse health effects and/or contamination.

-Mega-dose pills (more than 300% of daily requirement)  
-Herbal products and products containing herbal additives (not listed as **RED**)  
-Protein powders/shakes  
-Creatine  
-Amino Acid mixtures  
-"Proprietary" ingredients  
-**YELLOW** risk products made by companies that manufacture any **RED** risk products.



High risk of adverse health effects and/or contamination.

Anything with the words:

-"Andro-" or "Nor" (**Prohibited!**)  
-Ephedrine or Ma Huang or Guaranna - (**Prohibited!**)  
-"Anabol" or "Diol"\*\*\* or "Test"\*\*\*  
-"Reduces water retention"\*\*\*  
-"Energizer" or "Energy"\*\*\*  
-"Weight Loss"\*\*\*  
-"Muscle Builder" or "Stack" or "Stak" \*\*\*  
\*\*\*Likely to be or contain prohibited substances.

Avoid products from companies that manufacture any of the above or any other prohibited substances.

Along with the US Anti-Doping Agency (USADA), USA Swimming considers dietary supplements "take at your own risk," placing full responsibility for any effects and repercussions on the athlete. The ultimate decision to use a dietary supplement is the sole responsibility of the athlete and one that should not be made in haste. All athletes are advised that the use of dietary/nutritional supplements is completely at the athlete's own risk, even if the supplements are "approved" or "verified." If you take dietary/nutritional supplements you may test positive for a prohibited substance, which is not disclosed on the product label. This would result in a doping violation. Please visit [www.usa-swimming.org](http://www.usa-swimming.org) and [www.usantidoping.org](http://www.usantidoping.org) for important information regarding the risks of taking dietary supplements and the regulation of supplements in the United States. This chart was prepared by USA Swimming, 1 Olympic Plaza, Colorado Springs, CO (719) 866-4578.

\*For health reasons, athletes who have not completed puberty should not use any product with an **ORANGE** or **RED** risk.\*

**To inspire and enable our members to achieve  
excellence in the sport of swimming and in life.**

**Good Luck!**



**Swim Fast!**