



# Become a Nutrition 'Expert' in 60 Minutes!



Mark Hesse

Sport Performance Consultant



- 27+ year career as a club coach at: Washington Township, Sugar Creek Swim Club, Ft. Worth Area Swim Team, Mission Bay Makos, Burke Barracudas
- ASCA Level 5 Certified Coach
- Placed swimmers in Olympic Trials Semi-Finals and on National Junior Team



# Nutrition: Swimmer/Parent Challenges

- Little knowledge about:
  - Basic nutrition
  - Grocery shopping
  - Food preparation
  - What to choose when eating out
- Hectic schedules
- Good nutrition isn't always a priority
  - Time
  - Money





# Nutrition Knowledge

## Survey of Adolescent Swimmers:

- Most nutritious carbohydrate?
  - 63% chose an apple while 37% chose French fries
- Good source of protein?
  - 63% chose chicken, while 37% chose oatmeal
- Food Groups?
  - 95% identified the food groups, but only 45% could identify foods from the group

Berning et.al, IJSN, 1991



# Today's Key Topics

- Why Nutrition
- Proper Fuel
- Dehydration
- Supplement dangers
- Recovery from training & meets





# Nutrition: **Goals and Philosophy**

***SUPPORT*** the body's energy needs associated with the different training ***VOLUME*** and ***INTENSITY*** stressors throughout the training year to bring about positive physiological responses.

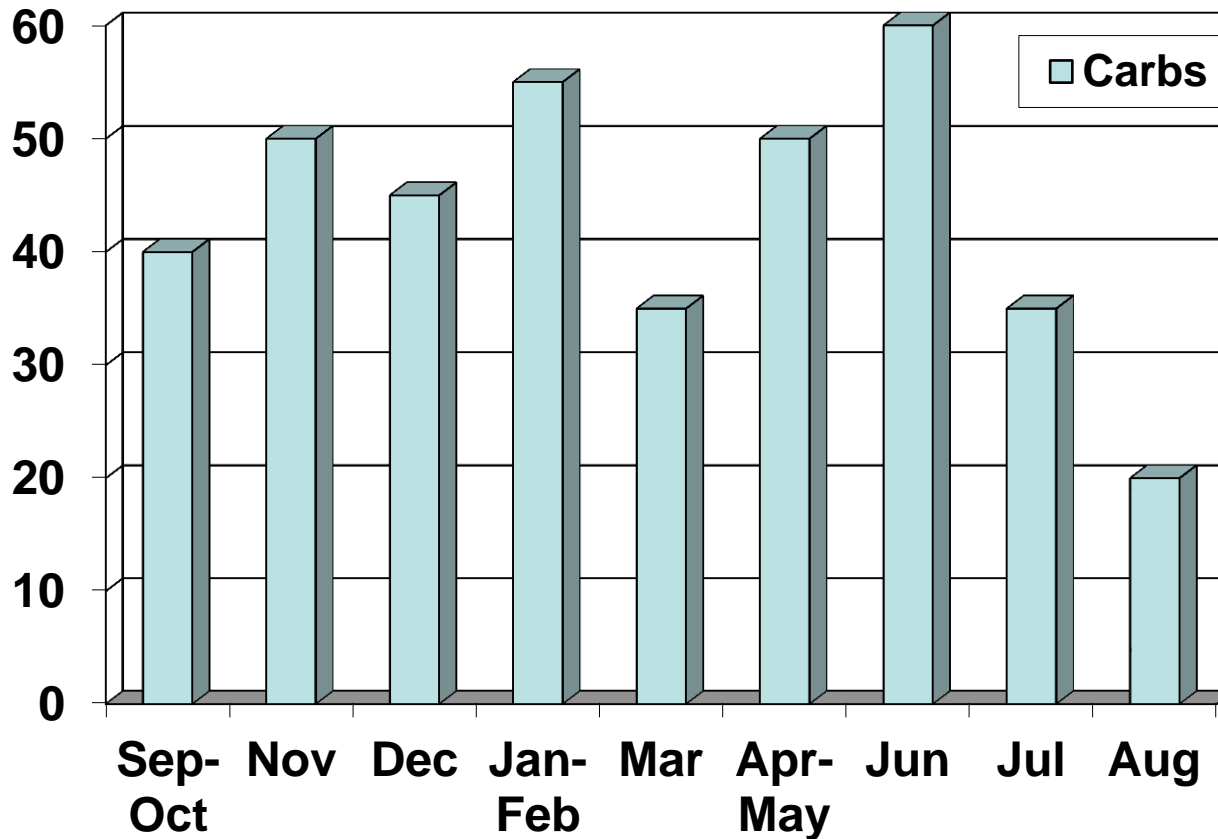
***“Eat to train, don't train to eat.”***

***“Competition in the Kitchen”***

***“The 24/7 Athlete”***



# Year Plan-Eat to Train



Match calorie intake to volume & intensity of training



# Transition Between Seasons



- Do not eat like an athlete
- Low intensity alternative or cross-training activities
- **MAKE WEIGHT CHANGES NOW!**





# Prepare Your Body Nutritionally for Training and Racing

- Good Nutrition Habits Over Time Positively Influence Training
- Good Nutrition Habits Over Time Positively Influence Racing
- Pre-event Meal is not a “Cure-all”



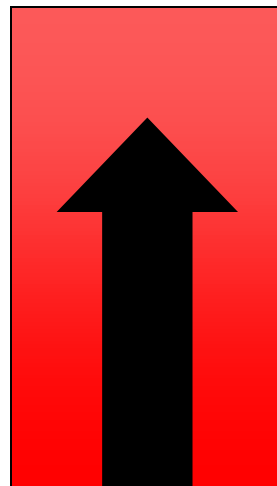




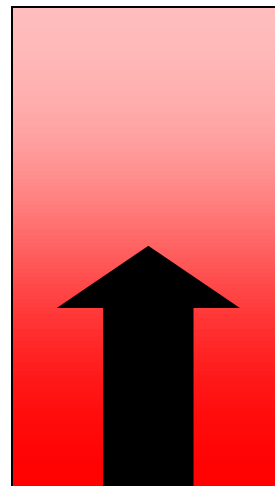
# Good Nutritional Habits



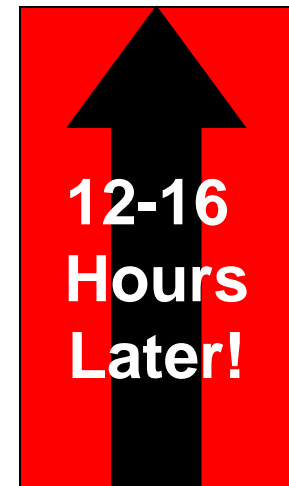
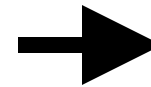
Pre-Training  
Monday AM



During Training  
Monday PM



Post Training  
Monday PM

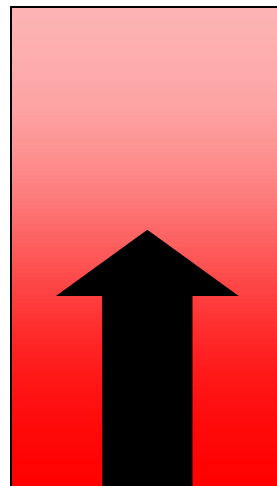




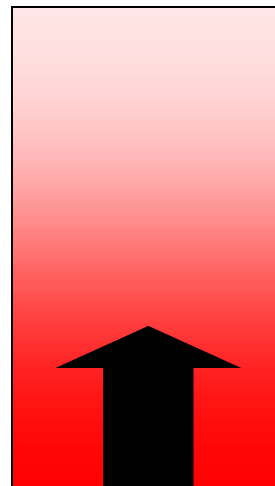
# Poor Nutritional Habits



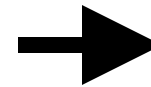
Pre-Training  
Monday AM



During Training  
Monday PM

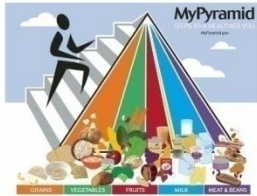


Post Training  
Monday PM





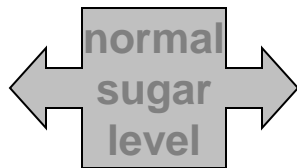
# Nutrition Foundations...



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



**Eat Colorful Foods (5 per meal!)...Including *Recovery*.**



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



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



# Proper Fuel





# Proper Fuel: The Facts

- Swimmers training regimen is comparable to tri-athletes, long-distance runners and cyclists
- Moderate and high-intensity training is fueled by **carbohydrates.**
- The human body is extremely receptive to carbohydrates within the **first ½-hour post training**



# Proper Fuel: Carbohydrates

- Secondary fuel for easy activities
- Primary fuel for moderate activities
- Dominant fuel for high intensity activities



**Carbohydrates are the Primary Fuel Source for Swimmers**



# Proper Fuel: Carbohydrates

## Good Sources:

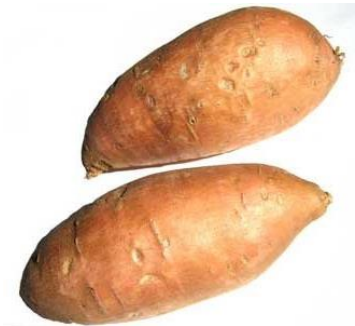
Bread, Crackers



Cereal

Bagels, English muffins

Pasta



Potatoes, Rice

Corn, Beans, Peas

Apples, Dates, Grapes, Bananas

Fruit Juice



# Proper Fuel: **Protein**



- Builds and repairs muscles
- Produces hormones
- Supports the immune system
- Replaces red blood cells

**Protein is not a source of energy!**



# Proper Fuel: Protein

## Good Sources:

Lean Meat, Fish &

Chicken

Cheese

Milk

Nuts

Soy products



Legumes (peas, beans)



# Proper Fuel: **Fat**

- Fuels low-intensity exercise
- Taste and Satiety
- The Bad News:
  - 1 g Carbs = 4 cal
  - 1 g Protein = 4 cal
  - 1 g Fat = **9 calories!**
- **FAT** has more than double the calories







# Proper Fuel: Fat

## Good Sources:

- Lean meat, fish & chicken
- Margarine
- Low-fat salad dressing
- Frozen yogurt



- 2% or skim milk
- Avocados
- Nuts & Seeds

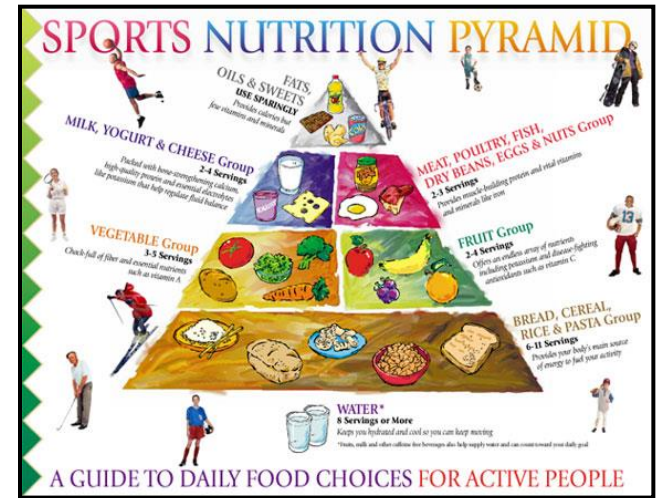




# Proper Fuel: Well Balanced Diet

Carbohydrates.....60%  
Protein.....15 %  
(Carbs: Protein = 4:1)  
Fat .....25%

One-fourth of your Calories come from Fat!  
One-eighth of your food?





**Make half your plate fruits and vegetables.**



**Vary your protein food choices.**

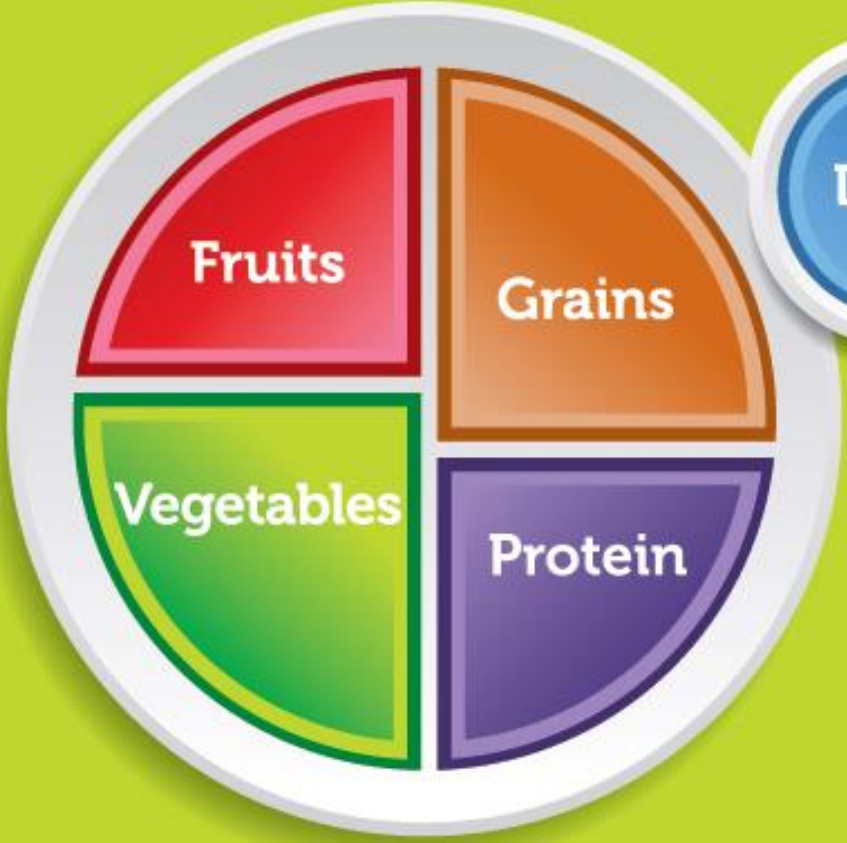


**Make at least half your grains whole.**



**Switch to skim or 1% milk.**





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CLUB DEVELOPMENT DIVISION  
Sport Performance Consultants





# Proper Fuel: **Nutrition Practices**

- 30% of adolescent athletes skip breakfast
- 25% skip lunch
- 86% eat at fast food restaurants each week



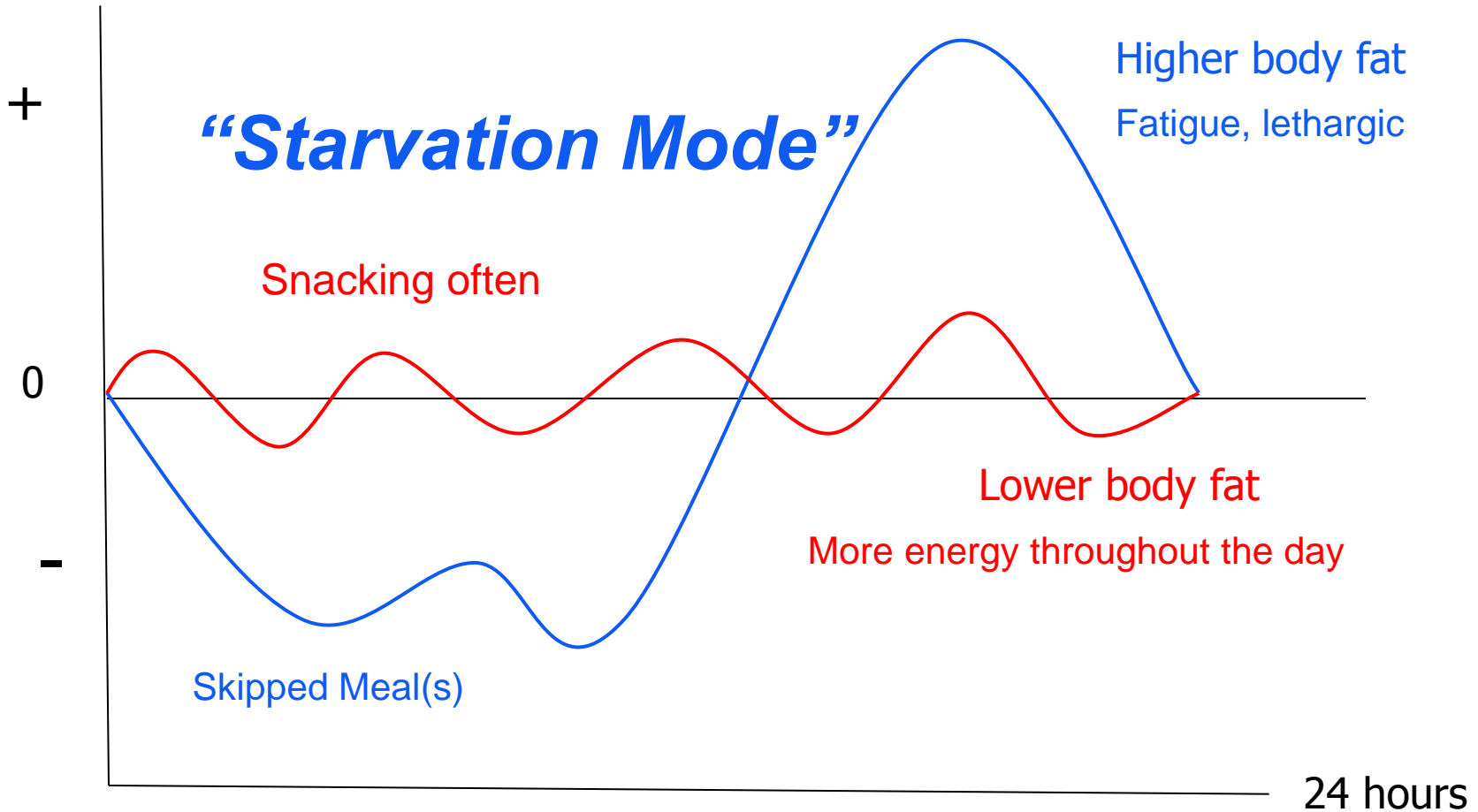


# Proper Fuel: **When to Eat**

- It's not just what you eat, but **WHEN** you eat it!
- Athletes should never go more than 3-4 hours without a snack or meal during the day (except nighttime)
- Eat many (5-6) small meals
- Don't skip meals – ever!



# Proper Fuel: Effects of Skipping Meals



**Athletes who skip meals and only eat one meal per day have higher body fat**

Deutz et al, 2000 Med Sci Sports Exerc 32(3) 659-68



# (De)Hydration





# Dehydration: The Facts



- Water weight loss of just 2% can impair performance
- High protein diets can lead to dehydration in endurance athletes
- If exercising longer than 90 minutes or intensely for longer than 60 minutes a sports drink of **6-8% carbohydrates** concentration is better than water.



# What is 6% Carbohydrate?

<b>Nutrition Facts</b>	
Serving Size 8 fl oz (240ml)	
Servings Per Container 1	
<b>Amount Per Serving</b>	
<b>Calories 50</b>	
<b>% Daily Value*</b>	
<b>Total Fat</b> 0g	<b>0%</b>
<b>Sodium</b> 110mg	<b>5%</b>
<b>Potassium</b> 30mg	<b>1%</b>
<b>Total Carbohydrate</b> 14g	<b>5%</b>
Sugars 14g	
<b>Protein</b> 0g	

Not a significant source of Calories From Fat, Saturated Fat, Cholesterol, Dietary Fiber, Vitamin A, Vitamin C, Calcium, Iron.

\* Percent Daily Values are based on a 2,000 calorie diet.

8 ounces = 226.8 grams

**14** grams total Carbs

$(14/226.8) =$

**6%**

% of Recommended Daily Value  
(Based on 2,000 kcal/day)



# Dehydration: Facts

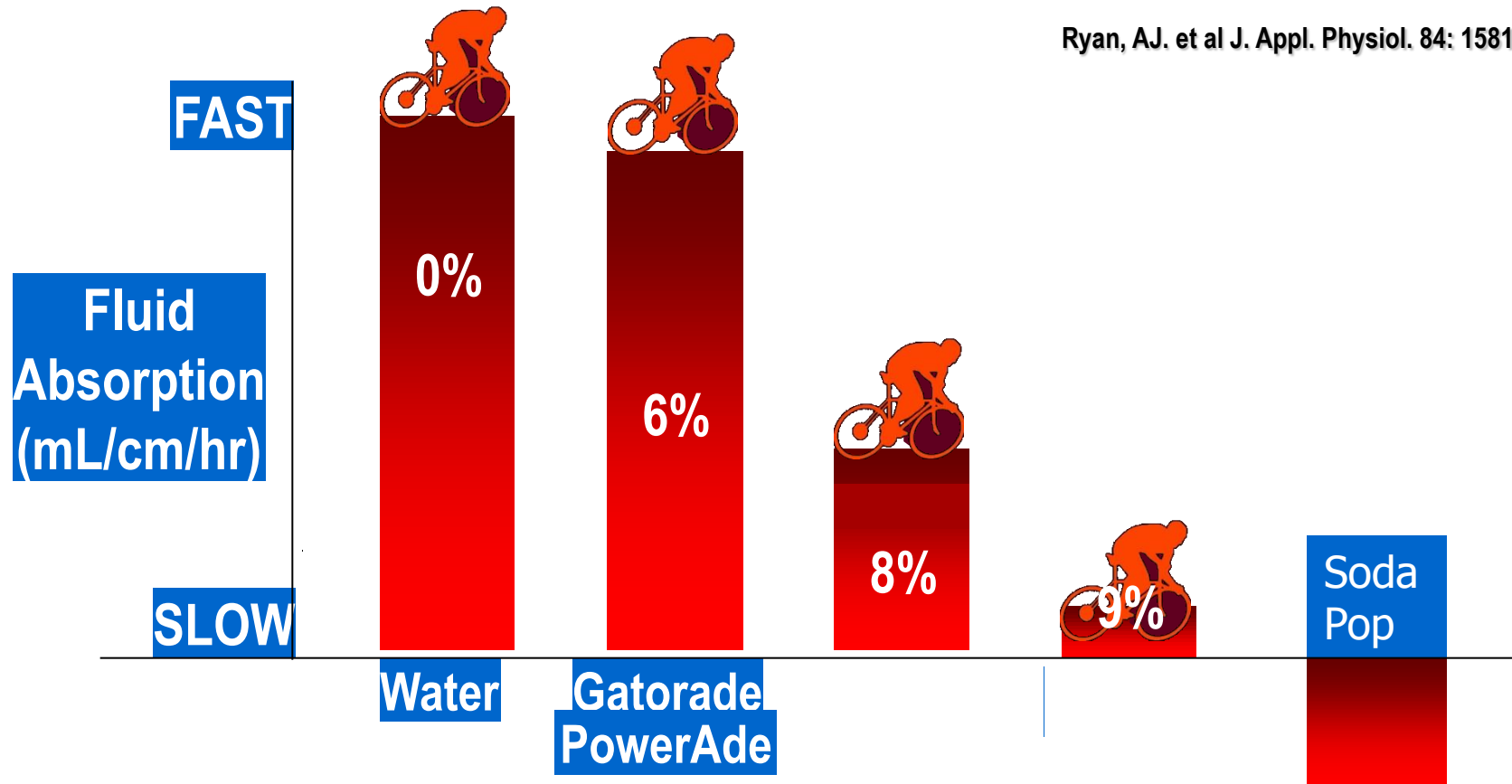
- Impairs physiology
  1. Increased Heart Rate
  2. Increased Blood pressure
- Impairs performance
  - Aerobic isn't aerobic anymore
- Sports drinks and supplements
  - The good, the bad and the ugly





# Sport Drink Optimal Fluid Absorption

Ryan, AJ. et al J. Appl. Physiol. 84: 1581-1588, 1998





# Dehydration: Monitor Fluid Loss

## Two ways:

1. Weigh in before practice and after practice (need 3 cups of fluid replacement per pound lost)
2. Check the color of urine  
**(Certain vitamins will temporarily change urine color)**

## AM I HYDRATED?

Urine Color Chart

1		
2		If your urine matches the colors 1, 2, or 3, you are properly hydrated.
3		Continue to consume fluids at the recommended amounts.
4		If your urine color is below the <b>RED</b> line, you are
5		<b>DEHYDRATED</b> and at risk for cramping and/or a heat illness!!
6		<b>YOU NEED TO DRINK MORE WATER!</b>
7		
8		



1 - 3 = Optimally Hydrated

4 - 6 = Slightly dehydrated should drink more

6 - 8 = Dehydrated, must drink more



# Hydration: **How Much and When**

## Practice

- 16-20 oz. of water two hours before
- 8-10 oz. of water 10-20 minutes before
- 4-8 oz. of water or sports drink every 15 minutes during
- Replenish within two hours after

## During the day

- 16-20 oz. of water within two hours of
- Avoid feeling thirsty during the day
- 8-10 oz. of water before sleep



**I'm thirsty**





# Hydration: **Additional Notes**

- Use a clean water bottle- **DO NOT SHARE!**
- Cool drinks are better
- High carbohydrate sports drinks contribute to dehydration
- Nutrition Facts vs. Supplement Facts



# Nutrition: Facts vs. Supplements

<b>Nutrition Facts</b>	
Serving Size 1/2 cup (51.0 g)	
Amount Per Serving	
<b>Calories</b> 237	Calories from Fat 82
<b>% Daily Value*</b>	
<b>Total Fat</b> 9.1g	<b>14%</b>
Saturated Fat 3.6g	<b>18%</b>
Polyunsaturated Fat 1.2g	
Monounsaturated Fat 3.5g	
<b>Cholesterol</b> 1mg	<b>0%</b>
<b>Sodium</b> 26mg	<b>1%</b>
<b>Total Carbohydrates</b> 33.5g	<b>11%</b>
Dietary Fiber 4.2g	<b>17%</b>
Sugars 11.5g	
<b>Protein</b> 5.3g	
Vitamin A 0%	Vitamin C 2%
Calcium 6%	Iron 7%
<b>Nutritional Units</b> 5	
* Based on a 2000 calorie diet	

APPROVED

<b>Supplement Facts</b>		<b>Amount Per Serving</b>		<b>% DV</b>
Serving Size: 3 Level Scoops (99.9 g)		Folic Acid		200 mcg 50%
Servings Per Container: 15		Vitamin B12		3 mcg 50%
Amount Per Serving	% DV			
Calories	370	Biotin	150 mcg	50%
Calories from Fat	45	Pantothenic Acid	5 mg	50%
Total Fat	5 g 8%*	Calcium	500 mg	50%
Saturated Fat	1.5 g 8%*	Iron	11.8 mg	65%
Cholesterol	85 mg 28%*	Phosphorous	580 mg	58%
Total Carbohydrate	40 g 13%*	Iodine	75 mcg	50%
Dietary Fiber	9 g 36%*	Magnesium	200 mg	50%
Sugars	3 g †	Zinc	7.5 mg	50%
Protein	40 g 80%*	Selenium	35 mcg	50%
Vitamin A	2500 IU 50%	Copper	1 mg	50%
Vitamin C	60 mg 100%	Manganese	1 mg	50%
Vitamin D	100 IU 50%	Chromium	60 mcg	50%
Vitamin E	10 IU 100%	Molybdenum	37.5 mcg	50%
Thiamin	0.5 mg 50%	Sodium	160 mg	7%
Riboflavin	0.85 mg 50%	Potassium	630 mg	18%
Niacin	10 mg 50%	L-Glutamine	2,000 mg	†
Vitamin B6	1 mg 50%	† Daily Value not established. ‡ % Daily Value are based on a diet of 2,000 Calorie Diet.		

**Ingredients:** CARBOHYDRATE BLEND (OAT FLOUR AND BARLEY FLOUR), PROTEIN BLEND (WHEY PROTEIN CONCENTRATE, CALCIUM CASEINATE, EGG ALBUMEN, SODIUM CASEINATE), WHEY PROTEIN ISOLATE), COCOA, L-GLUTAMINE, GUM ACACIA, NATURAL & ARTIFICIAL FLAVORS, VITAMIN MINERAL BLEND (DICALCIUM PHOSPHATE, MAGNESIUM OXIDE, ASCORBIC ACID, BETA-ALPHA TOCOPHERYL ACETATE, NIACINAMIDE, ELECTROLYTIC IRON, ZINC OXIDE, COPPER GLUCONATE, D-CALCIUM PANTOTHENATE, MANGANESE SULFATE, RETINYL PALMITATE, PYRIDOXINE HYDROCHLORIDE, THIAMIN MONONITRATE, RIBOFLAVIN, CHROMIUM CHLORIDE, FOLIC ACID, BIOTIN, POTASSIUM IODIDE, SODIUM MOLYBDATE, SODIUM SELENITE, CYANOCOBALAMIN, AND CHOLECALCIFEROL), GUM BLEND (CELLULOSE GUM, XANTHAN GUM, AND CARRAGEENAN), SILICA, SALT, AND SUCRALOSE.

DECLINED

USADA  
United States Anti-Doping Agency



# Regulation and Validity

**Claims made by the manufacturers and distributors of dietary supplements regarding the effectiveness of their products do not require evaluation by the US Food and Drug Administration. The failure of a supplement's ingredients list to match the product's contents 100% opens the door for...**

**positive drug tests!**



# It Happens...



## AdvertisingAge®

Vitaminwater Runs Afoul of NCAA

**Banned-**

**Substances Rule Major College-Sports Sponsor  
Has Six Flavors Players Shouldn't Drink**

*Published:* February 10, 2009

NEW YORK (AdAge.com) -- Coca-Cola's Vitaminwater is a major marketing partner for the NCAA -- but its players shouldn't drink six of its varieties or they **might test positive for banned substances.**





# “Energy” Drinks

- Contain a blend of sugars and electrolytes
- These drinks help with activities that last 90 minutes or more





# Stimulant Drinks





# Stimulant Drinks

## Adverse Effects

- Combine MANY DIFFERENT stimulants
- Short-term energy boost by accelerating consumption of the body's fuel stores
- Long-term robs the user's true energy from carbs, protein, fat, hydration, and rest





# Stimulant Drinks



## Other Adverse Effects:

- Anxiety, tremor, insomnia
- Aggressiveness
- Addiction
- Increased risk of
  - Stroke,
  - Heart attack,
  - Cardiac Arrhythmia,
  - Sudden Death





# JUMPER CABLES FOR THE BRAIN.

- Improves Performance
- Increases Endurance
- Increases Concentration
- Improves Reaction Speed
- Stimulates Metabolism



**RED BULL GIVES YOU WIIINGS.®**





# Do Sports Drinks Work?





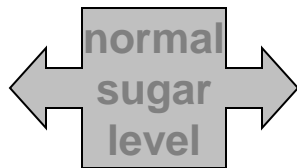
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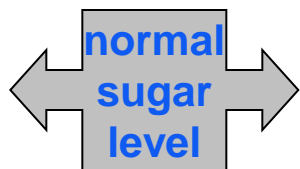
# Recovery



# Recovery: **When to Begin?**

- BEFORE practice?
- DURING practice?
- AFTER practice?
- **ALL OF THE ABOVE!**





# Recovery: When to Eat

- Athletes should have a carbohydrate snack before morning workouts (even if small amount)
- Athletes should never go more than 3-4 hours without a snack or meal during the day
- Training that lasts longer than 90 minutes must include a carbohydrate snack or a sports drink
- Athletes must have a carbohydrate snack immediately after practice
- Athletes must have a meal within 1-2 hours after practice.



# Good Recovery Habits

## Training

- Cool-down after high-intensity training sessions
- Begin the nutritional replenishment process immediately\*  
(\*30 minute 'window')
- Follow up with a meal

## Competition

- Cool-down soon after your race for at least 20 minutes
- High carb-moderate protein snack (4:1) immediately\* after your race
- Follow up with a meal



# Sample Recovery Foods

- Chocolate Milk
- Granola, energy or breakfast bars
- Bagels with peanut butter
- Sports drinks
- Recovery shakes
- Sub sandwiches
- Crackers and cheese
- Burritos
- Fresh fruit like apples, bananas, oranges, grapes
- Vegetables such as carrots and celery
- Fruit smoothies (prepackaged)
- Trail mix/animal crackers





# By Product Accumulation and Removal AKA WARMDOWN

Recent research has indicated that negative metabolites (Carbon Dioxide, Hydrogen ions, etc) in addition to lactic acid contribute to impaired muscle performance (contraction).



# WARMDOWN





# What is Lactate Production?

- High Intensity = Anaerobic Pathway
- By product is lactic acid (muscle) and lactate (blood)
- Other by products (Carbon Dioxide, Hydrogen ions, etc) also contribute to muscle fatigue.

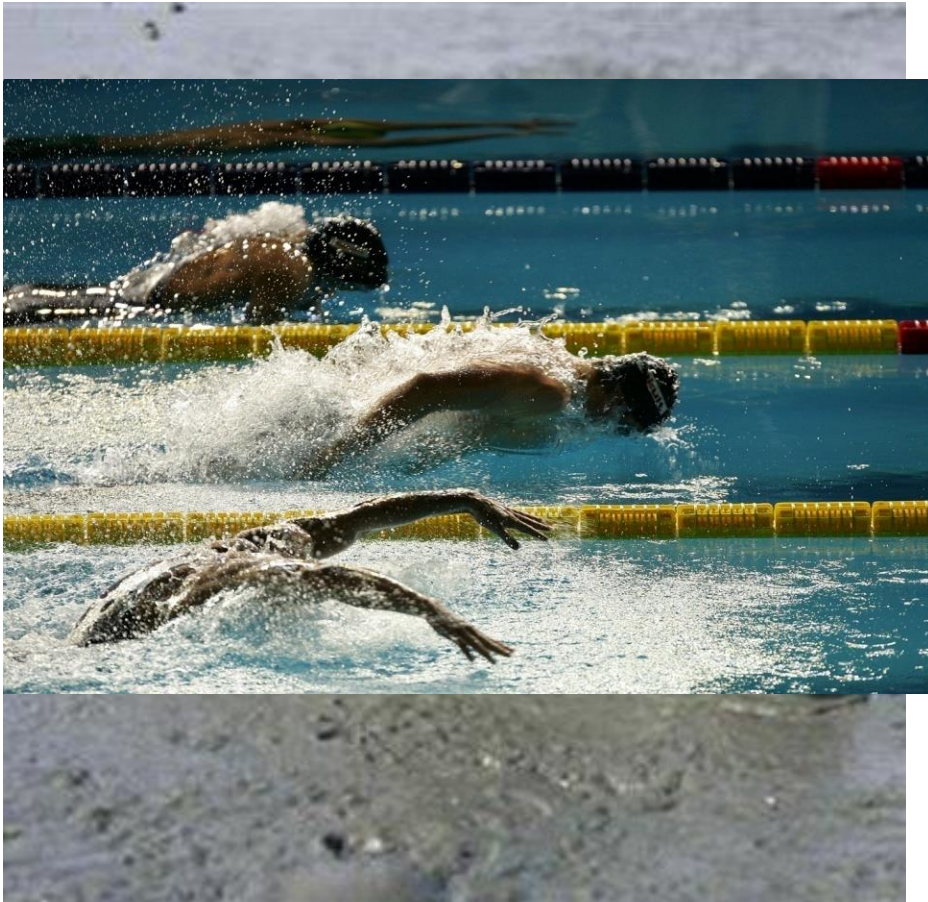




# By Product Accumulation and Removal

- By Product Accumulation
  1. Impairs muscle function
  2. Technique decay
  3. Compromise energy production pathways
- By Product Removal
  1. Takes place in muscle, liver and kidneys
  2. Lactate can be used for energy
  3. **Must be cleared for optimal performance**

# Active Recovery is Better!

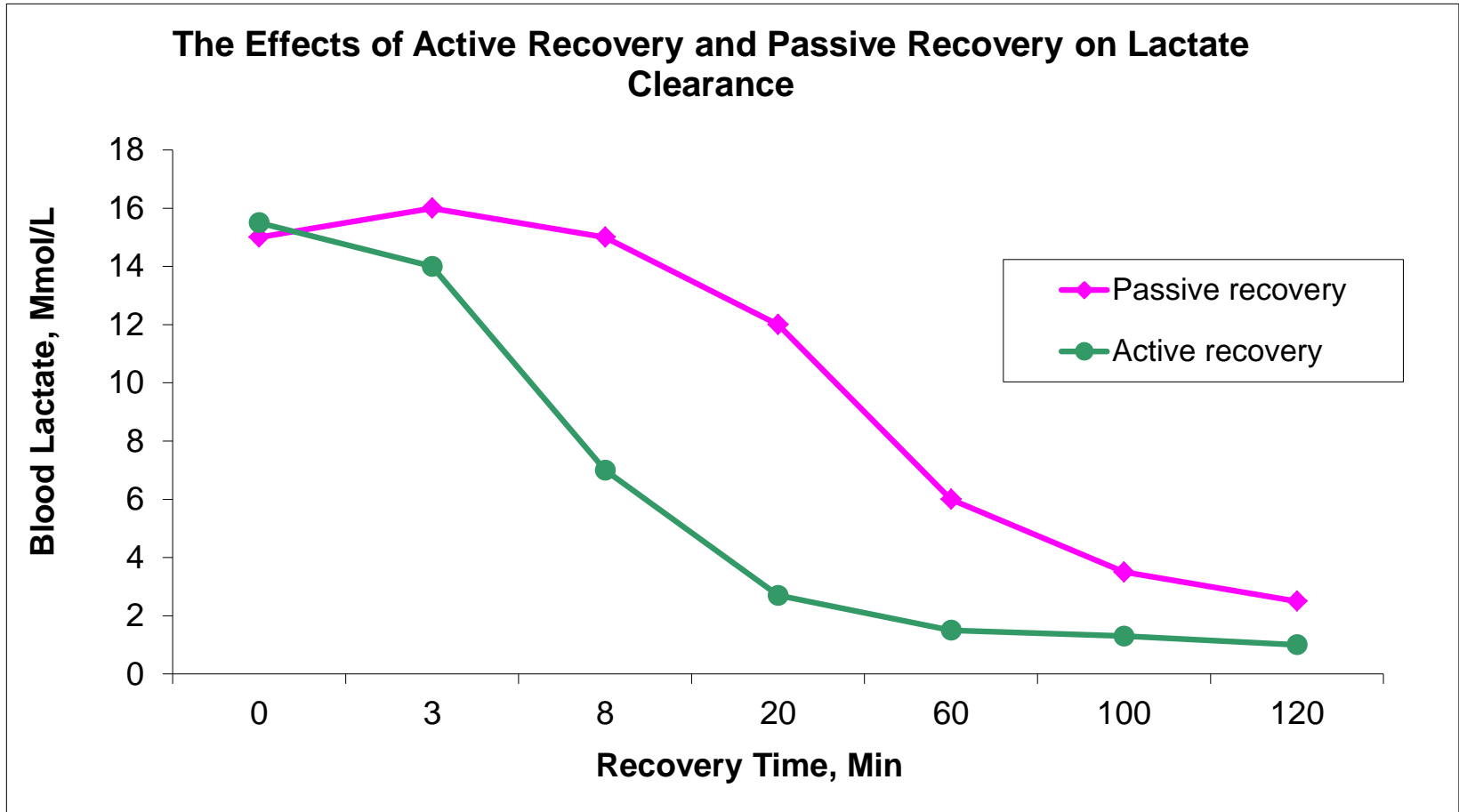


- Faster decrease in blood lactate levels
- Faster recovery time following intense efforts
- Perform at an optimal level for another race, set or workout



# Active vs. Passive Recovery

## Lactate and Other Byproducts







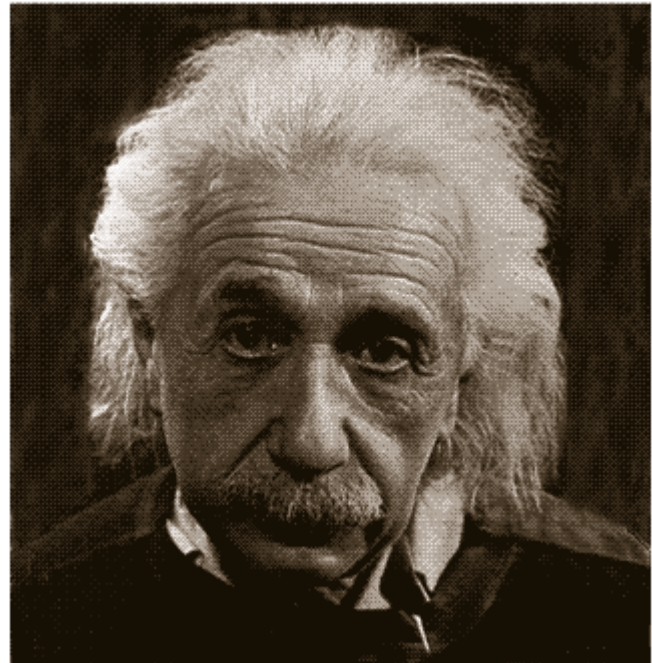
# What Should I do for Cool Down?

<i>Event/Distance Orientation</i>	<i>Duration</i>	<i>Intensity</i>	<i>Heart Rate</i>
Sprint Events (50-100m)	15-30 min	65-70%	130-140 22-23 (10 sec)
Mid-Distance Events (200-400m)	15-25 min	70-75%	140-150 23-24 (10 sec)
Distance Events (800m and above)	15-20 min	75-80%	150-160 25-26 (10 sec)



# Problems?

- Cool-down facility is not available
- Very little time between events
- The pool deck or venue is cold





# On-line Resources & Apps

- [www.usaswimming.org](http://www.usaswimming.org) (free)
- [www.sparkpeople.com](http://www.sparkpeople.com) (free)
- [www.myplate.gov](http://www.myplate.gov) (free)
- [www.nutriming.com](http://www.nutriming.com) (\$3.99)
- **MyFitnessPal** – Free
- **Loselt!** – Free
- **LiveStrong** – Lite free; full \$2.99



# Thanks To:

- Jackie Berning, PhD, RD, CSSD
- Bob Seebohar, MS, RD, CSSD, CSCS
- Dan McCarthy

# Questions?