



Fueling Up at NMH



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Outline

- **General nutrition:** building a performance plate.
- **Fueling up:** nutrition before, during, & after exercise.
- **Drinking up:** hydration before, during, & after exercise.
- **Real Life:** what does it look like?



Why Sports Nutrition?

SPORT SUCCESS = TIME + TRAINING + GENETICS + ... NUTRITION?

- Maximize gains: strength, speed, agility, power
- Increase concentration
- Improve endurance
- Reduce fatigue
- Recover faster
- Gain competitive edge over other teams



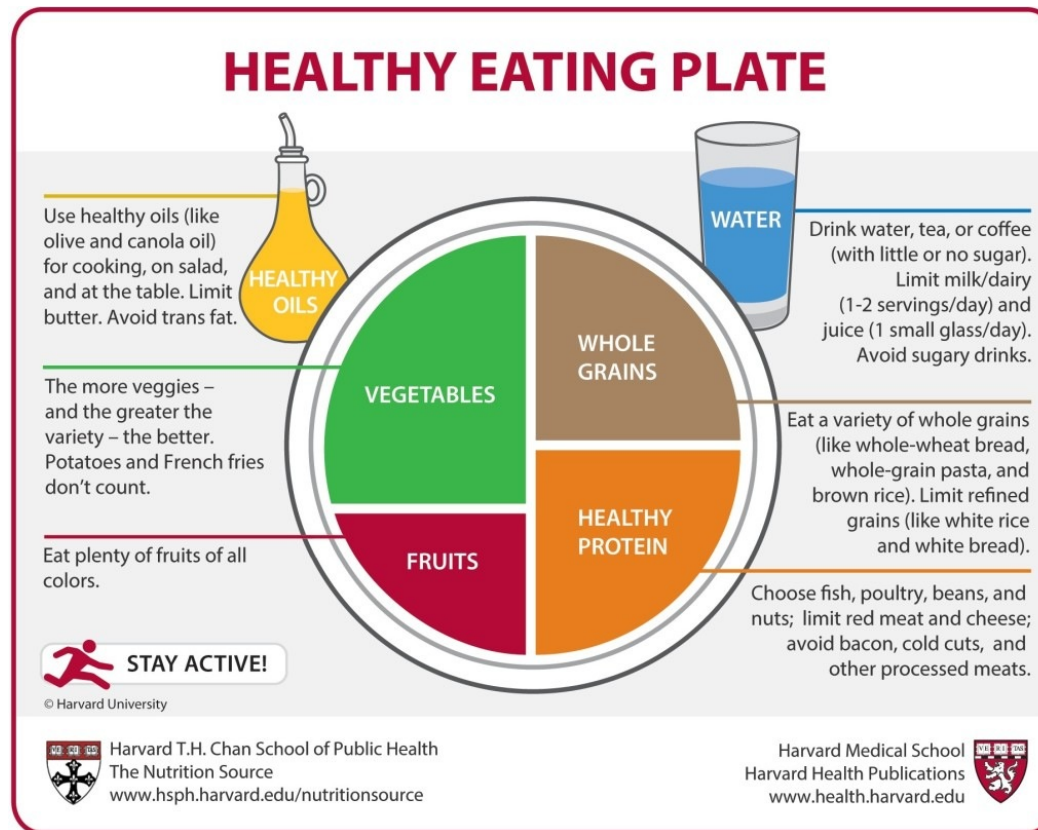
General Nutrition

Every meal is an opportunity to nourish the body, prevent disease, and promote health. The three most important decisions of our lives may be what to eat - for breakfast, lunch, and dinner.

A generally healthy diet for sports will:

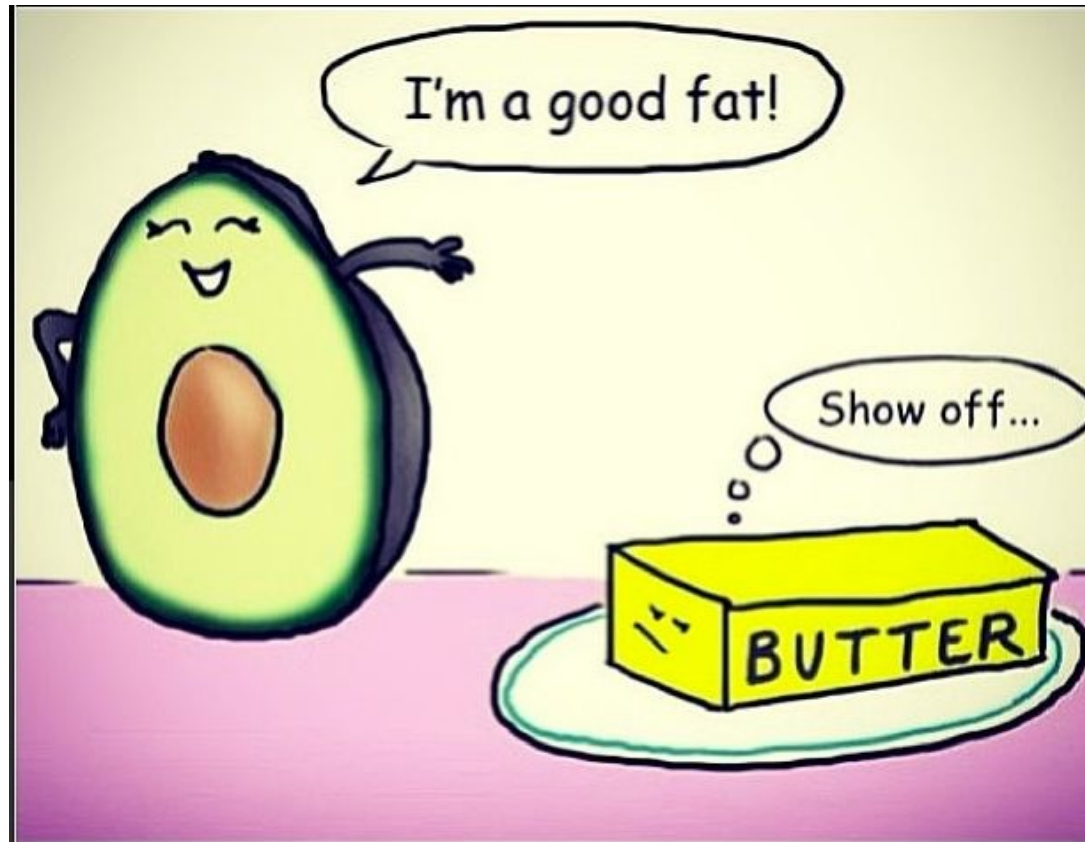
- provide the body with optimal fuel for performance,
- support good concentration and decision-making skills,
- decrease exercise-related inflammation,
- help heal injuries,
- promote post-exercise recovery, and
- facilitate overall well being.

General Nutrition



- Make most of your meal **vegetables** and **fruits** - 1/2 plate
- Go for **whole grains** - 1/4 plate
- **Protein** power - 1/4 plate

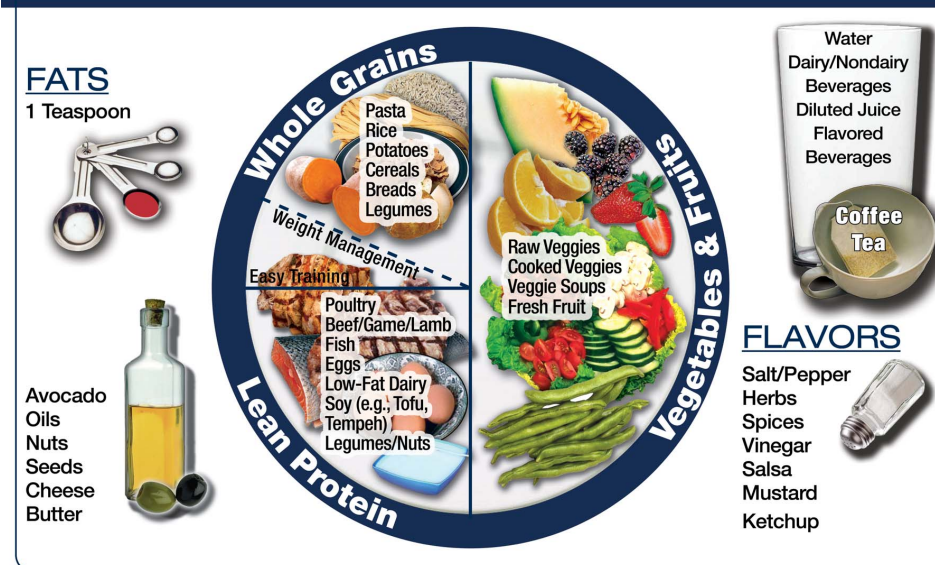
- Healthy **plant oils** in moderation
- Drink **water**, coffee, or tea; 1-2 servings dairy; 1 cup juice; (whole food smoothies OK)
- Stay active



Building a Performance Plate

ATHLETE'S PLATE

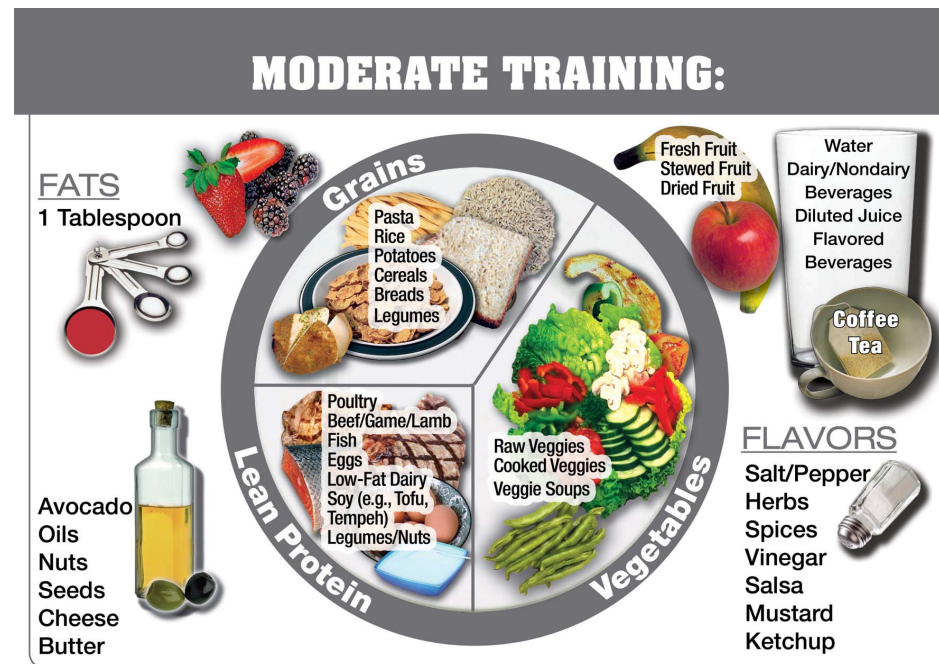
EASY TRAINING / WEIGHT MANAGEMENT:



The Athlete's Plates are a collaboration between the United States Olympic Committee Sport Dietitians and the University of Colorado (UCCS) Sport Nutrition Graduate Program.
For educational use only. Print and use front and back as 1 handout.

Building a Performance Plate

ATHLETE'S PLATE

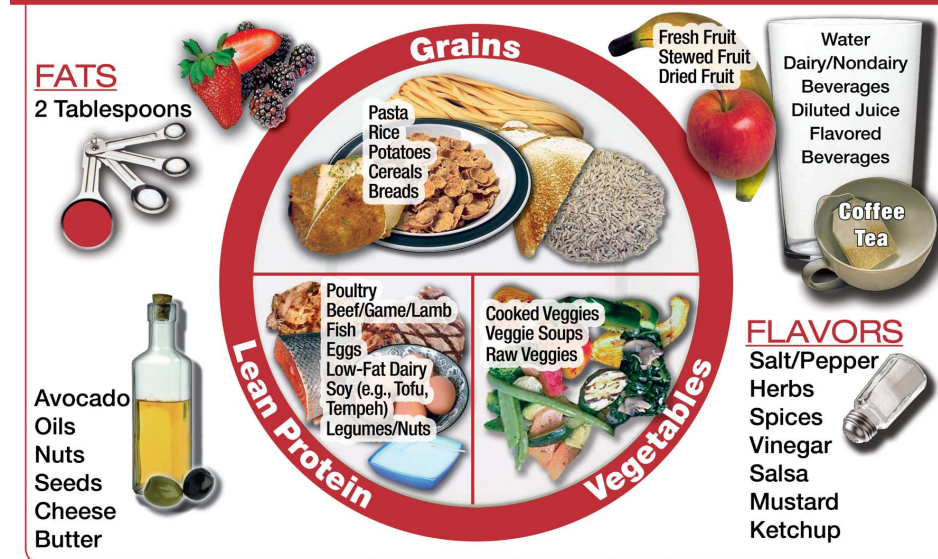


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Building a Performance Plate

ATHLETE'S PLATE

HARD TRAINING / RACE DAY:



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Fueling Up

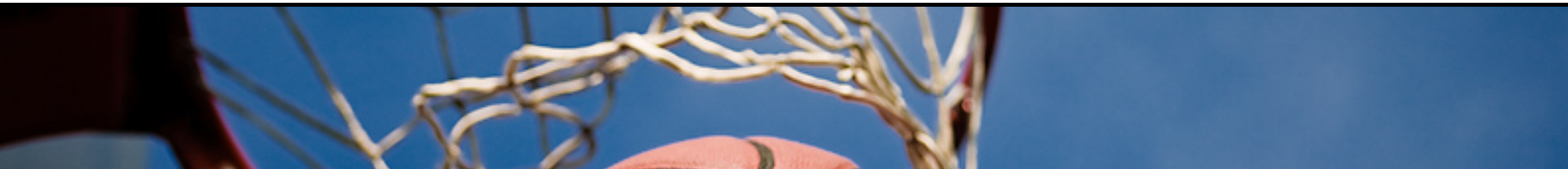
Goal: maximize glycogen stores, maintain blood glucose

- Functions of pre-exercise eating
 - Prevents hypoglycemia (low blood sugar)
 - Settles stomach
 - Fuels muscles & brain
 - Gives peace of mind

Nancy Clark's Sports Nutrition Guidebook

Go By Your Gut:

- ? avoid sugary foods
- Fatty foods usually not well tolerated
- Stick to familiar foods
- Finicky stomach? Try liquids





Which of the following would be the best choice to eat an hour before practice?

- A)** 6 oz. Greek yogurt with 1/4 cup almonds
- B)** 1-1/2 cups Cheerios with 1 cup 1% milk & 1 small banana
- C)** 2 cups mixed greens salad with 1/4 cup chickpeas & 2 Tbsp Italian dressing
- D)** 3 turkey-cheese-lettuce rollups (hold the wrap!) & 8 oz. apple juice



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Fueling Up - The Specifics

- **What?**

- Mostly carb, some protein, low fat, low fiber

- **How much?**

- 1 g/kg 1 hr before exercise
- Up to 4-4.5 g/kg 4 hrs before exercise

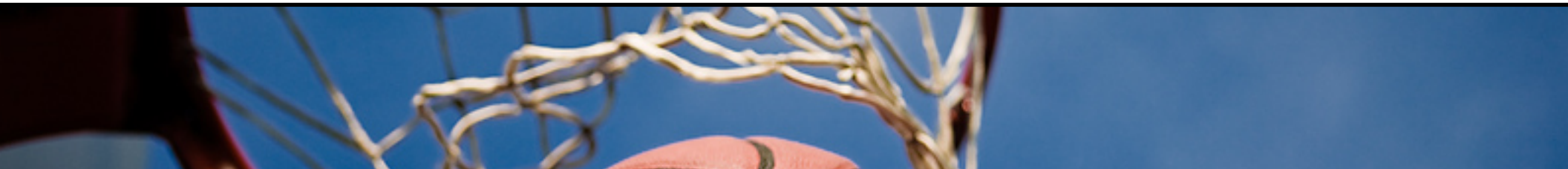
- **Digestion time**

- Large meal - 3-4 hrs
- Small meal - 2-3 hrs
- Blended/liquid meal - 1-2 hrs
- Small snack - <1 hr

140-lb athlete, 4:00 pm game,
Lunch @ 1:00 pm

- $140/2.2 = 64$ kg
- 64 kg * 3 g/kg = 192 g carbohydrate
- 2 PB, honey, & banana sandwiches,
1-1/2 cups soy milk, 1/2 cup carrot
sticks w/ 2 Tbsp hummus

- **Too jittery?** Eat well day before event
- **> 60 min exercise?** Add a little protein



“Put Me In, Coach!”

Game time: 2:30 pm



Breakfast @ 9:00 am

- 3 baked apple pancakes w/ maple syrup
- 1/2 cup scrambled eggs
- 1 cup fresh fruit
- 1 glass of milk

Lunch @ 12:30 pm

- 2 chicken tostadas
- 1 cup cilantro lime rice
- 1/2 cup cooked mixed vegetables
- 1 glass 50/50 apple juice/water

15-30 min pre-game

- handful crackers, banana, energy bar, dried fruit, sports drink, 2 fig bars

“Put Me In, Coach!”

Meet time: 11:00 am, 120-lb runner

Breakfast @ 8:00 am (165 g carb)

- 1-1/2 cups oatmeal w/ maple syrup
- 1 medium banana
- 6 oz. yogurt
- 1 slice toast
- 1 cup OJ

15-30 min pre-run (15-30 g carb)

- 8 oz. sports drink, 1-2 Medjool dates, 1 banana,
- 1/4-1/2 bagel, 1/2 energy bar





I'm freaking awesome.

Man, I'm looking good!

Check out this rim size!

this glass is half full of himself

pleated-jeans

Am I Hydrated?

How does an athlete know if he/she/they is/are adequately hydrated?

Frequency

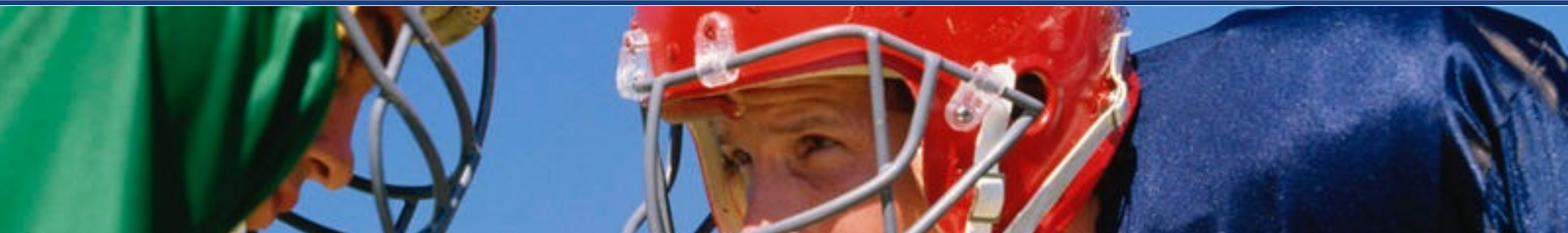
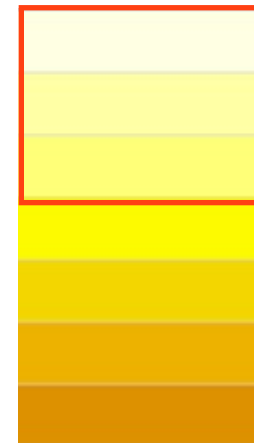
- Every 2-4 hrs

Color

- Lemonade, not apple juice

Symptoms

- Dry mucous membranes, lightheadedness, nausea, vomiting, palpitations, muscle cramps, fatigue



Effects of Dehydration

Physiologic

- ↑ core body temp
- ↑ CV strain
- ↑ glycogen utilization
- ↓ gastric emptying
- Altered CNS function

Performance

- ↓ speed, endurance, ↑ reaction time
- ↓ cognitive/mental performance
- For every 1% body weight loss:
 - HR ↑ 3-5 bpm
 - Speed ↓ by 2%
 - A 150-lb runner who loses just 3 lb fluid (2% loss) will slow down by 4%. That means a 6 min/mi is now a 6:14.5. For a 5K, that's almost a minute!



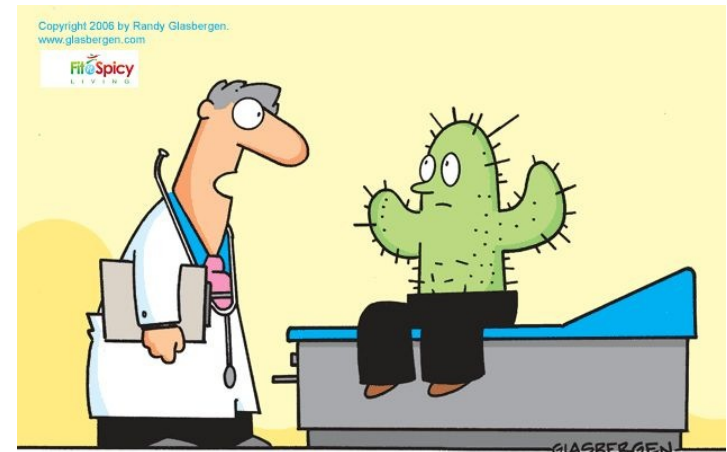
Water, water, all around...

Factors that influence sweat losses:

- Duration & intensity of exercise
- Environmental conditions
- Clothing/equipment
- Individual characteristics
- Illness, esp. vomiting/diarrhea, fever

Pre-exercise dehydration - why?

- Fluid deficit from previous workout
- Weight-class sports



"How many times must I remind you? *Eight glasses a day!*"



Pre-Exercise Hydration

When it's OK to go by thirst:

- > 8-12 hours since last session
- Exercising < 60 - 90 minutes
- Low-moderate effort
- Mild temperatures or indoors
- Light training days
- Rest days



When paying closer attention to hydration is recommended:

- < 8-12 hours since last session
- Exercising > 60 - 90 minutes
- Moderate-high effort
- Hot/humid temperatures
- Salty sweaters
- Wearing a lot of equipment
- Consistently losing too much weight pre-post exercise (>2%)

Drinking Up - The Specifics

Goal: begin exercise hydrated

- If it's been 8-12 hours since last exercise session, athlete is peeing normally (every 2-4 hours), urine is light in color, and there are no signs of dehydration, already hydrated. (*Drink according to thirst.*)
- **If not:**
 - **4 hours before:** slowly drink 12-20 oz. Check for urine frequency/color.
 - **2 hours before:** slowly drink 6-12 oz., up to 16 oz.
- **15-30 minutes pre-exercise:** slowly drink ~ 5-10 oz.

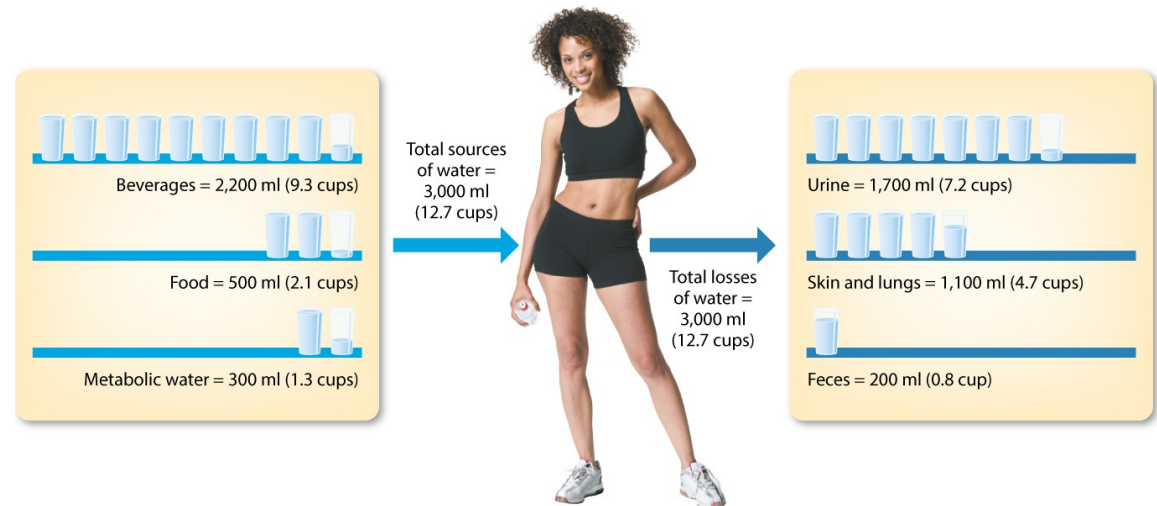
Averages based on 150-lb athlete. Individual needs may differ.

Beverages with sodium, salty snacks may help stimulate thirst & retain consumed fluids.



Drinking Up - Day to Day

Athletes need more fluid than the average individual to account for increased losses.



Recommended Fluid Intakes
Average Female: 9 cups per day
Average Male: 13 cups per day

Fueling Up - During Exercise

Goal: maintain BG levels & carb oxidation to enhance physical & cognitive performance

WHEN?

- During exercise lasting more than 60-90 minutes, OR if athlete is not adequately fueled pre-exercise
- Begin anytime from 30-60 minutes into exercise

WHAT?

- Mostly carbohydrates
- Ultra endurance: add protein

HOW MUCH?

- < 45 min: unnecessary
- 30-75 min: mouth rinse?
- 1-2.5 hrs: 30-60 g/hr
- > 2.5 hrs: 60-90 g/hr, variety

EXAMPLES:

- *Fruit:* orange slices, bananas
- *Dried fruit:* raisins, dates, cranberries, pineapple
- *Starches:* pretzels, bagels, crackers, tortillas
- *Sports products:* sports drinks, gummies, gels

Fueling Up - During Exercise

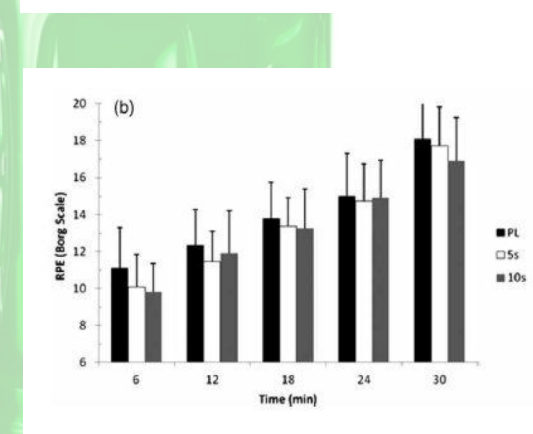
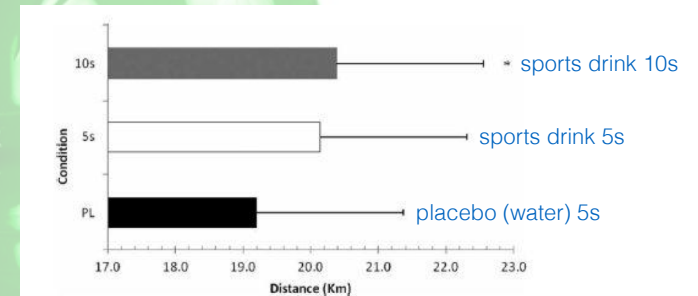
What it might look like:

- **20 minute 5K:** no fuel needed during exercise
- **80 minute 10-miler:** 1-2 dates or 1 sport gel around 45-50 minutes OK
- **2-hour soccer game:** 4 orange wedges @ half-time, sports drink during second half
- **Half day swim meet:** snacks/mini meals dispersed throughout meet, depending on timing of events (popular choices: low fat/fiber energy bars, bagels, graham crackers, fig bars, fruit/dried fruit, flavored milk, sports drinks, candies)



Swish & Spit?

- **Swish sports drink for 10s, then spit out**
- **4-10x/1 hr exercise**
- **↑ distance, ↓ RPE**
- **Benefits noted mostly for events ~ 30-75 minutes, but also observed during 6s sprints**
- **Strongest benefit if less full of carbs (ex. overnight fast), weaker effect if recently consumed carb-rich meal**
- **How big a boost? Around 2-3%!**



Jeukendrup, 2013

Drinking Up - During Exercise

Goal: prevent dehydration & excessive changes in electrolyte balance

- Most individuals need ~4-12 oz. fluid every 15 min (0.4-0.8 L/h) (*aim for 4-8 big gulps every 15 minutes*)
- Add electrolytes if > 1-2 hrs exercise, multiple sessions, large sweat losses (heat, equipment), salty sweaters
- Most accurate method for estimating fluid needs during exercise: calculate sweat rate

Calculating Sweat Rate

1. Weigh athlete immediately before exercise (after void, nude, or in as little clothing as possible), convert to ounces (16 oz./lb)
2. Keep track of amount of fluid consumed during exercise (oz.)
3. Weigh athlete immediately post exercise (as little clothing as possible), convert to ounces
4. $\text{Pre-Ex Wt} - \text{Post-Ex Wt} = \text{Wt Diff}$
5. $\text{Wt Diff} + \text{Total oz. consumed during exercise} = \text{Total Fluid Losses (TFL)}$
6. $\text{Divide TFL by total time spent exercising} = \text{sweat rate}$

Recovery - Refueling

Goal: restore muscle & liver glycogen

- **What?**

- Carb + a little protein

- **How much?**

- 1-1.2 g/kg carb/kgBW/hr
- 15-25 g protein (0.25-0.3 g/kgBW)
- 3-4: 1 ratio carb: pro

- **When?**

- Ideally, w/in 45 min of exercise, continue every 1-2 hr for 4-6 hrs

- **Examples:**

- 12 oz. chocolate milk; 1 cup cereal w/ 8 oz. skim milk & 1 Tbsp raisins; Half nut butter & jelly sandwich & 1 kiwi; 1/2 turkey sandwich & 1 banana; 1 cup pasta w/ meat sauce & 1 apple

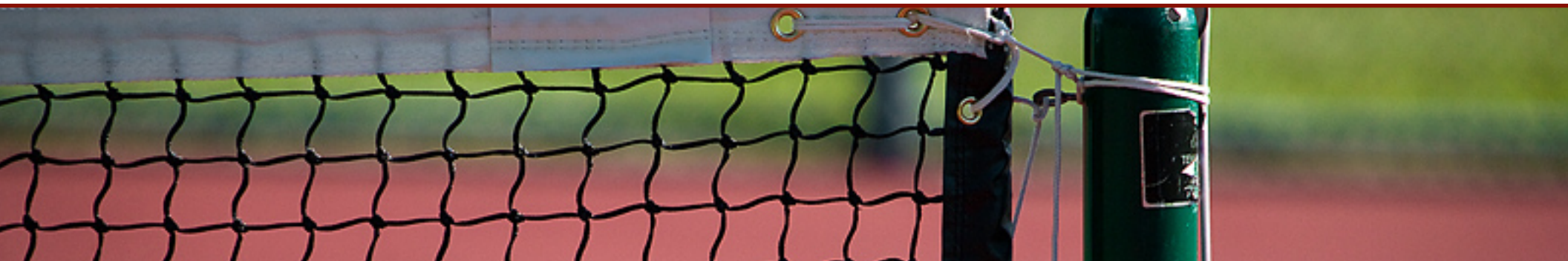
What it does:

- Restores muscle & liver glycogen
- Repairs muscles
- ↓ muscle soreness
- ↓ cortisol
- ↓ overeating
- Preserves immune function

Recovery - Rehydrating

Goal: replace fluid lost during exercise

- **How much?** 20-24 oz. fluid per lb BW lost (125-150% of losses)
- **Strategies to enhance recovery fluid intake:** sports drinks, desirable beverages, avoid beverages that may cause GI distress (ex. fruit juices)
- **Electrolyte replacement:** sports drinks +/- water w/ snacks; add extra salt to diet if lose >3-4% BW



Putting It All Together

- 8:30 am - hot oatmeal with fresh fruit & walnuts, slice whole grain toast, 1 cup calcium-fortified OJ, hot cocoa
- 12:00 pm - pasta with red sauce, chicken, fruit, 2 cups water
- 3:00 pm - raisins & pretzels, 1 cup water
- **3:30 pm - practice** (1/2-1 cup water/sports drink every 15 minutes)
- 6:00 pm - Buddha bowl (brown rice, black beans, tofu, sweet potato, salsa, spinach, peppers), 1 cup milk, 1 cup water, mixed berry cobbler



Putting It All Together

- 7:00 am - 2 whole grain pancakes, fruit, nuts, maple syrup, hard boiled egg, 1 cup milk, 1 cup water
- 10:30 am - banana, 1 cup sports drink
- **11:00 am - game** (orange wedges, water/sports drink, pretzels/rice cakes)
- 1:30 pm - turkey sandwich, side salad, 8-12 oz. fruit & yogurt smoothie, 1-2 cups water
- 3:30 pm - grapes & string cheese or trail mix
- 5:30 pm - red lentil soup, oat dinner roll, cooked mixed vegetables, 1-2 cups water, ice cream cone



Take-Home Tips

- **Develop a nutrition & hydration plan:** work backwards from practice/competition time, don't forget about recovery
- **Try new foods/routines on practice days**
- Keep a **journal**
- **Coaches - remind your athletes** of the importance of pre- and post-exercise fueling/hydrating
- Have **carbohydrate-rich snacks available before/during** practices/competitions (sports drinks, bananas, raisins, crackers, pretzels, bagels, etc.)
- **GI issues?** Keep it simple: liquids, easily digestible foods, low fiber
- **GF options?** Fruit, dried fruit, potatoes, sweet potatoes, dairy products, rice, sports drinks, other GF grains (millet, sorghum, teff, amaranth), some GF products



For Questions or To Contact:

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