

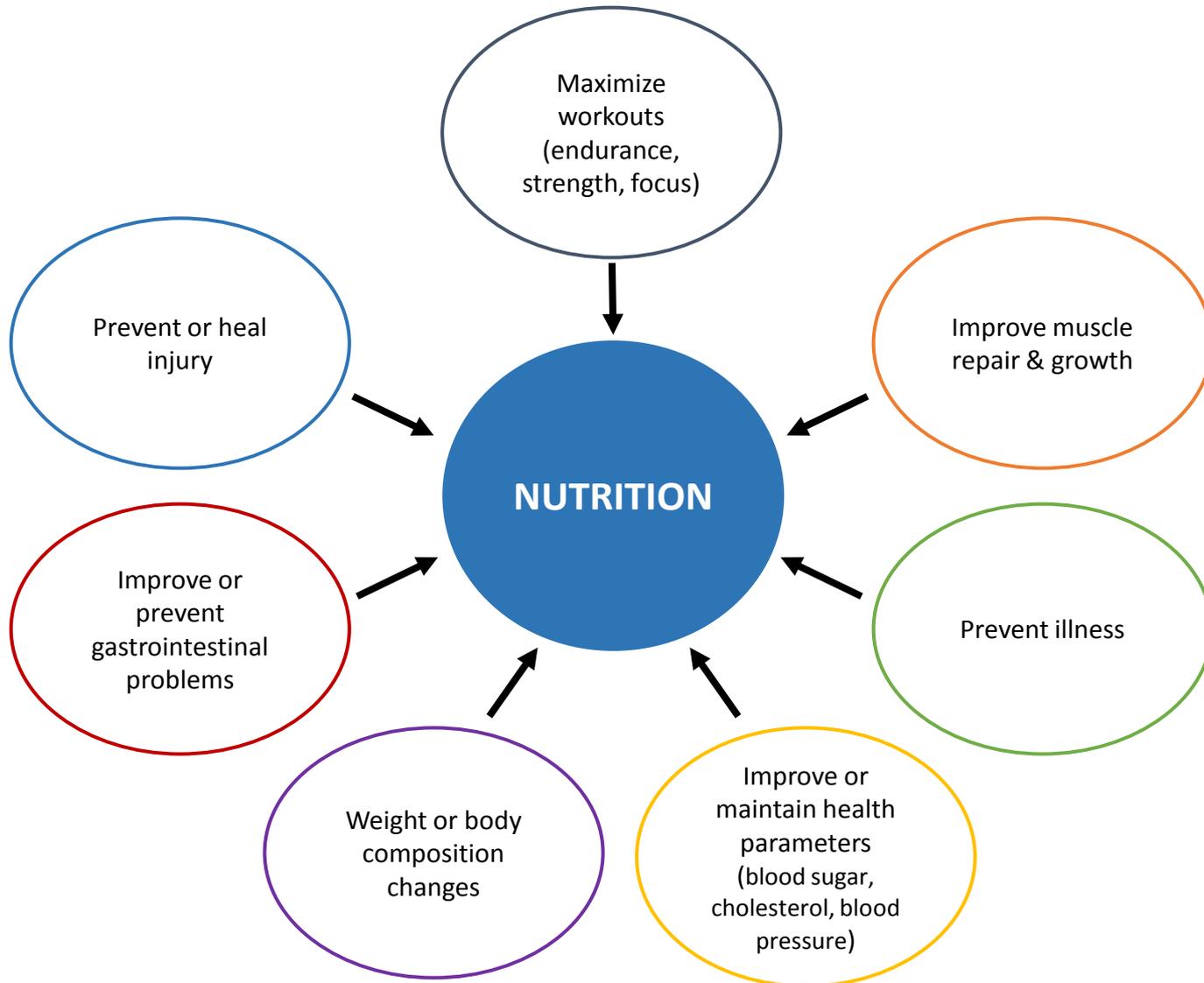
Nutrition for Performance

LCDR Lauren Trocchio, RD, CSSD, LD, USCGR

Registered Dietitian

Certified Specialist in Sports Dietetics

Why think about nutrition?



Daily vs Workout/Competition Fueling

“We are what we repeatedly do. Excellence, then, is not an act, but a habit.”

-Aristotle

Our best results are with a consistent, balanced approach.



80/20

Factors to consider for fueling recommendations....

- What type of activity?

Endurance vs speed

Cardio vs strength

Individual vs team

- What is the frequency?

Daily vs twice daily vs 3-4 days per week

- What is the intensity?

Low vs moderate vs high

- What is the goal?

Weight loss vs weight/muscle gain

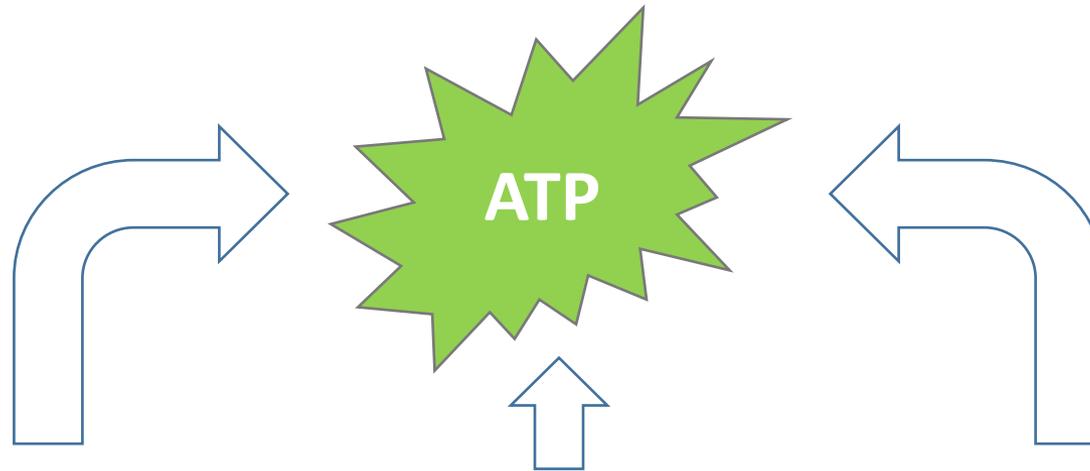
Improved strength vs improved endurance vs increased speed

Competition vs recreation

NOVEMBER 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12 10 miles tempo
13	14	15 Intervals	16 Strength, yoga	17	18 3 miles recovery	19
20	21	22	23	24	25	26
27	28	29	30			
		Notes				

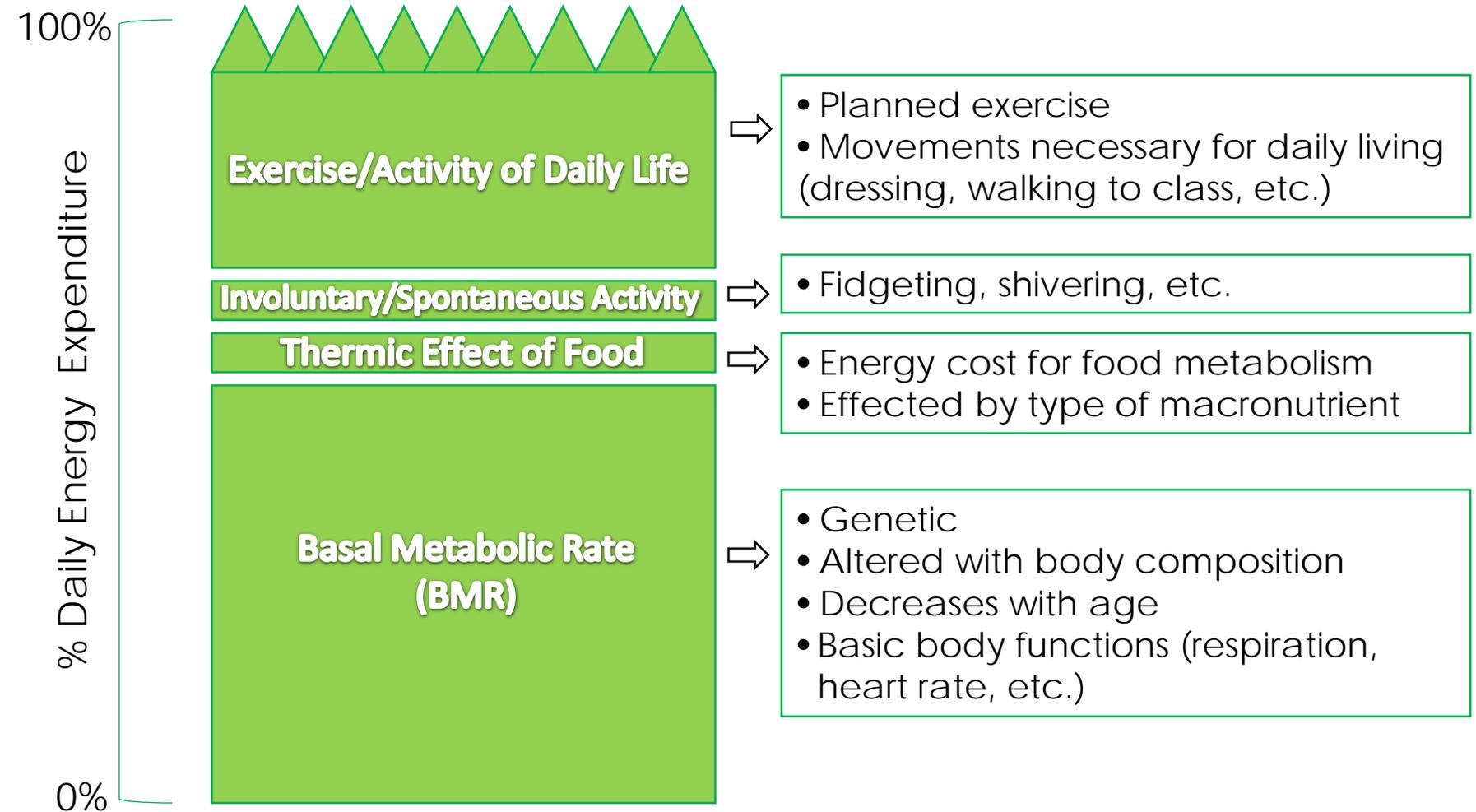
The Basics of Energy Use in the Body



Phosphagen System (ATP/phosphocreatine)	Anaerobic (glycogen/glucose)	Aerobic (glucose/fat)
< 10-15 second bursts Needs time (minutes) to replenish	15 second – 2-3 minutes Limited by lactate threshold, stored carbs, & ongoing intake	Continuous “Endless” supply from fat
Sprints Weight lifting “Fast breaks”	Tempo work HIIT Intermittent team sports (soccer, basketball)	Walking Endurance run/cycling/swimming Daily life – organs, etc.

How to fuel depends on the system used, and the system used depends on the type of activity.

Energy Needs of Individuals



Determining Energy Needs

(Harris Benedict)

Females BMR (kcal):

$$655 + 9.56 (\text{weight in kilograms}) + 1.85 (\text{height in centimeters}) - 4.68 (\text{age})$$

Males BMR (kcal):

$$66.5 + 13.75 (\text{weight in kilograms}) + 5.0 (\text{height in centimeters}) - 6.78 (\text{age})$$

(weight in kilograms = weight in lbs/2.2)

(height in centimeters = height in inches x 2.54)

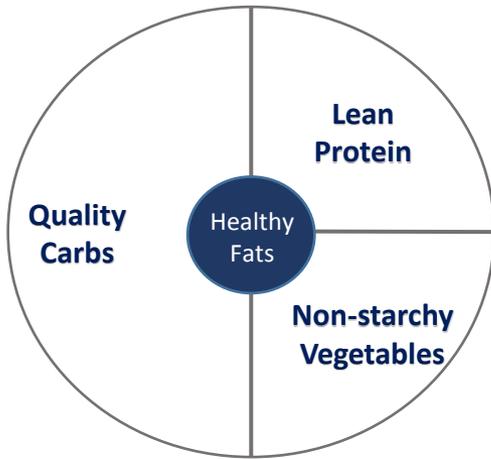
Total Daily Energy Needs = BMR * Activity factor

Activity Factor	Description
1.2	Sedentary
1.375	Light exercise/sports 1-3 days/week
1.55	Moderate exercise/sports 3-5 days/week
1.725	Hard exercise/sports 6-7 days/week
1.9	Very hard exercise/sports and physical job or daily double workouts

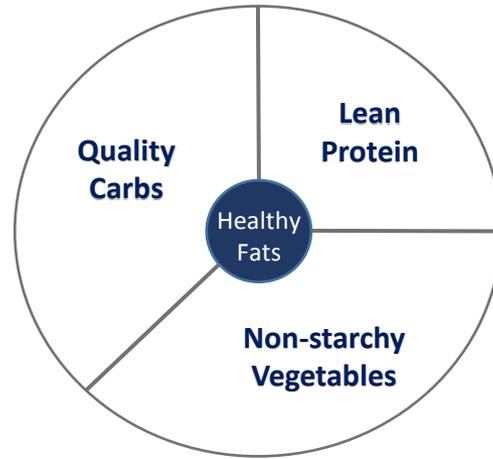
The Plate Guideline

A visual proportion guide of nutrient needs

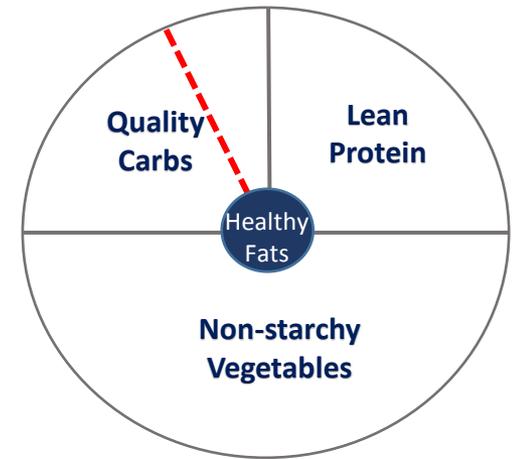
The Active Individual's Plate



- Endurance activities: marathon, century cycling, half/full IM triathlon, 2+ hours of team sport
- Twice daily workouts
- Smaller individual trying to gain weight

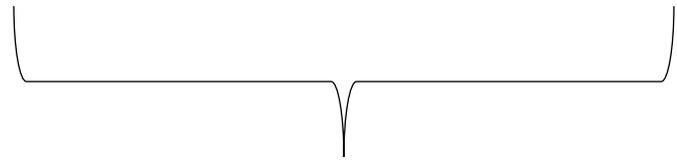
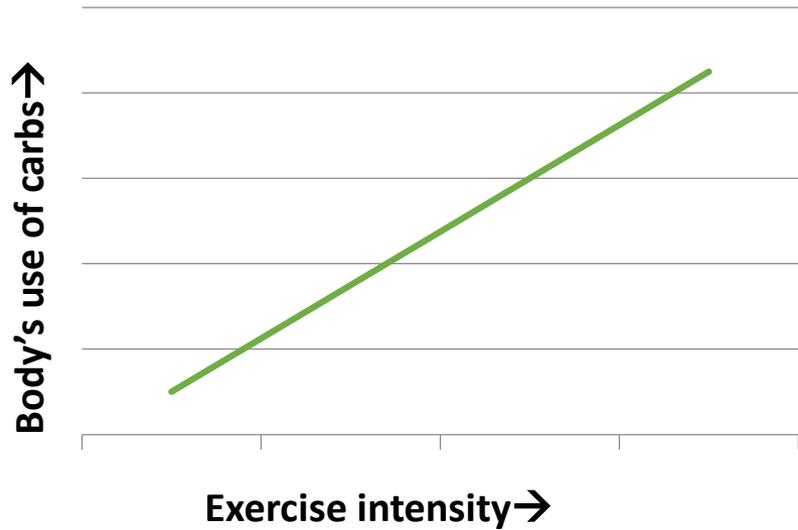


- Endurance activities: 5k-10k running, sprint triathlon, 1-2 hours team sport
- Larger individual trying to lose weight



- Recreational activities: walking, 30 min cardio 3-4 times weekly
- Smaller individual trying to lose weight
- With reduced calories, need higher protein

Quality Carbohydrates



Carbs stored as **glycogen** in muscle and liver, but limited capacity.

- ✓ Energy source
- ✓ Essential for bursts of energy
- ✓ Delays fatigue
- ✓ Aids focus (blood sugar)

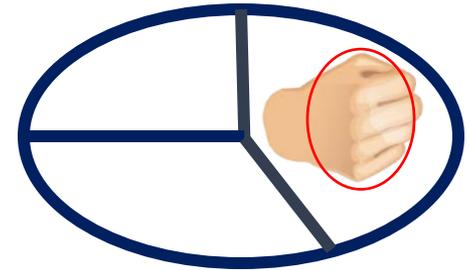
Quality Carbohydrates

- Potatoes/sweet potatoes
- Brown rice
- Quinoa
- Barley
- Whole grain pasta
- Whole grain bread
- Oatmeal/cereal
- Fruit (fresh, frozen, or canned in fruit juice)
- Tortillas
- Corn
- Butternut or acorn squash
- Beans
- Low-fat dairy (milk, yogurt)

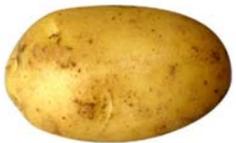
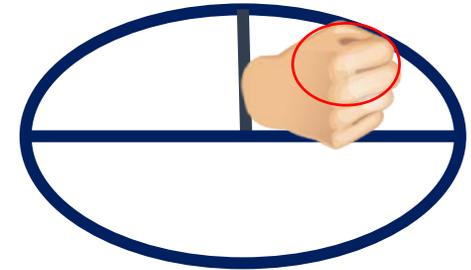
~1 ½ - 2 cups



~1 - 1 ½ cups

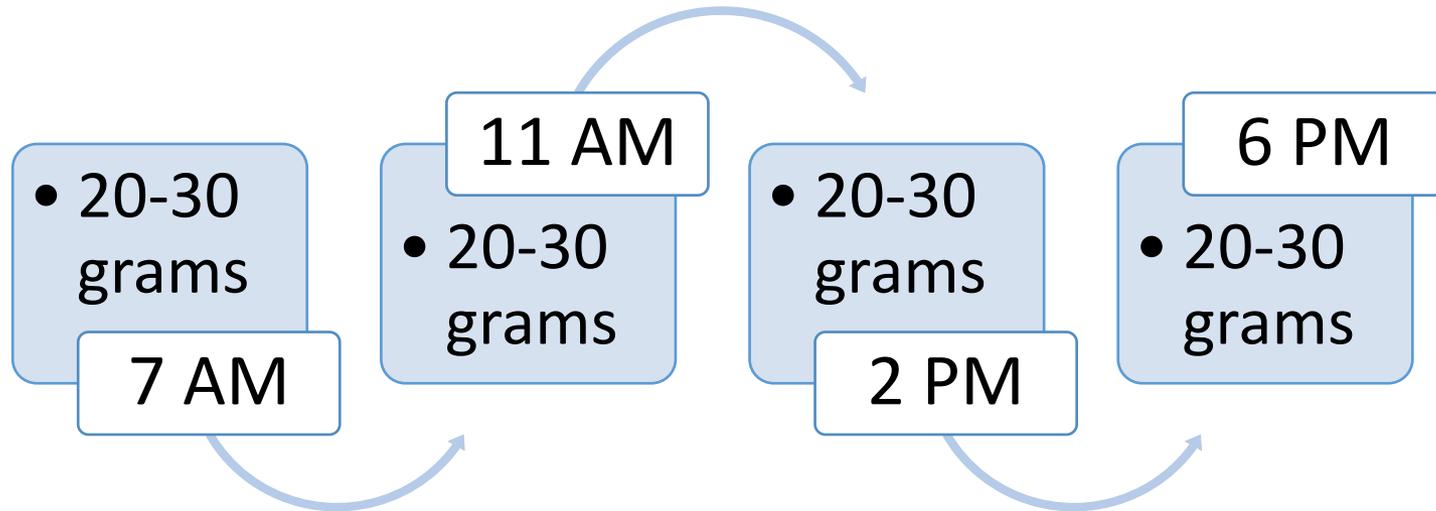


~ ½ cup



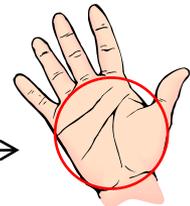
Power-Packed Protein

- ✓ Very “specialized”
- ✓ Muscle and tissue growth and repair – Recovery!
- ✓ No storage
- ✓ Protein is the building block – carbs are the energy that allow the muscle to do the work to grow



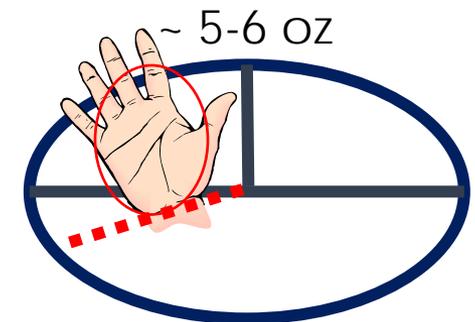
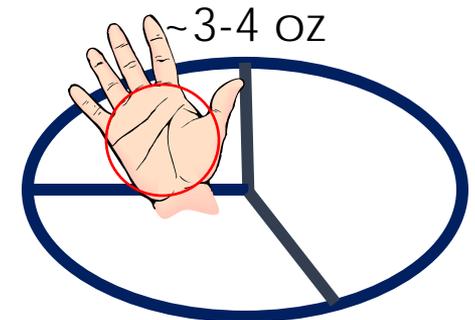
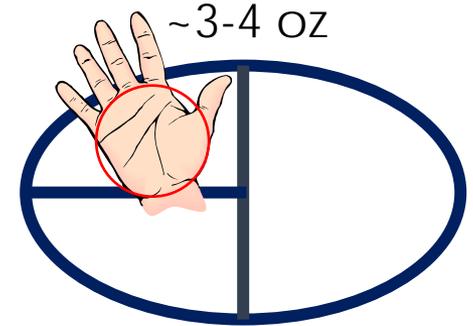
Ex. 150lb runner
→ 95-105 grams/day

3-4 oz
20-30 grams protein



Power-Packed Protein

- Fish
- Chicken, turkey
- Lean cuts of pork or beef
- Low-fat dairy (milk, yogurt, cottage cheese, cheese)
- Soy (tofu, soy milk, edamame)
- Beans, lentils
- Nuts, seeds
- Eggs



Vegetables

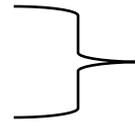
Vitamins

Minerals (electrolytes)

Fiber

Water

**Phytochemicals
(antioxidants)**



Help access energy, muscle contractions, heart rate



Vegetables

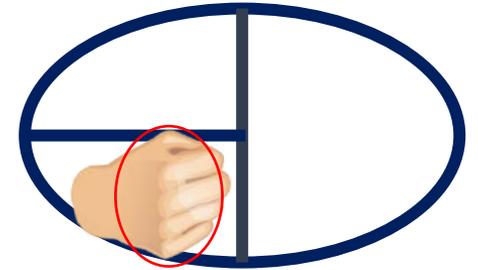
- Spinach
- Broccoli
- Carrots
- Tomatoes
- Cauliflower
- Asparagus
- Peppers
- Green beans

- Celery
- Mushrooms
- Cucumber
- Cabbage
- Eggplant
- Zucchini
- Onion

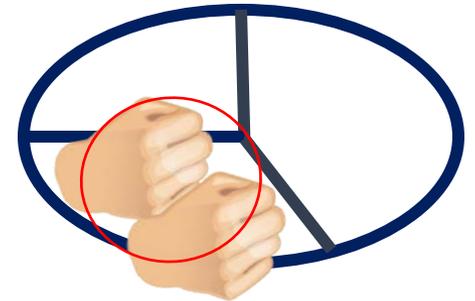


- ✓ On a sandwich
- ✓ In pasta dishes or lasagna
- ✓ On a pizza
- ✓ Grilled, sauteed, roasted

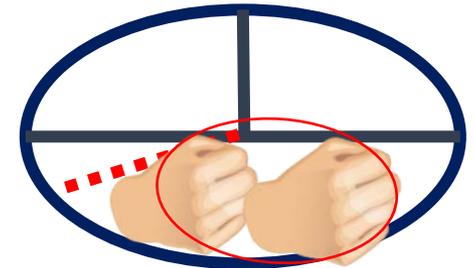
~1 cup



~1- 1 ½ cups



~ 1 ½ - 2 cups



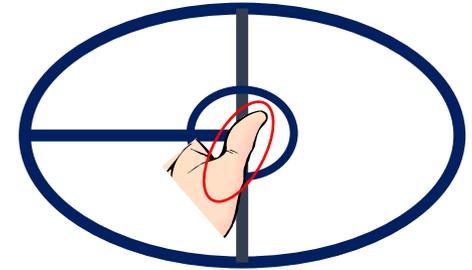
Healthy Fats

- Olive oil
- Canola oil
- Walnuts
- Avocado
- Almonds
- Flax seeds/oil
- Fatty fish (salmon, mackerel, sardines)

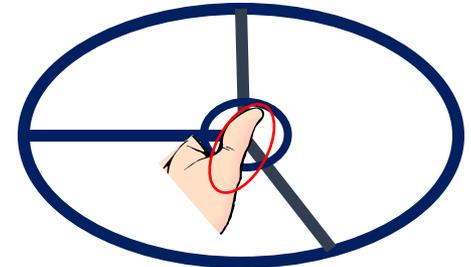


- ✓ Aim for more monounsaturated and omega-3s (polyunsaturated)
- ✓ Minimize:
 - Packaged baked goods, full-fat dairy, fried foods, "fatty" meats

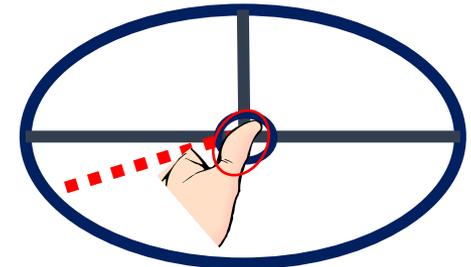
~1 – 1 ½ tbsp



~1 tbsp



~ 1-2 tsp



Meals that take less than 10 minutes...



Hydration

Understanding fluid needs

Hydration Around Workouts & Races

Drink based on thirst

- I'm a recreational exerciser
- I do races and workouts < 1 hour in length



Drink based on schedule

- I do races and workouts > 1 hour in length
- I'm a heavy sweater
- I do more than one workout per day
- I have a strenuous job and I work out



Hydration Around Workouts & Races

- Individualize your fluid needs
 - “Sweat test”
 - Changes with environmentals
 - Avoid dehydration OR hyponatremia
- Replace electrolytes
 - Sodium lost the most (genetic, temps)
 - 500 mg – 2000 mg per liter (2 lbs) of sweat
- Carbs and electrolytes help retain fluid (pre, during, and post)
- Every 1 lb lost during workout, replace with 20-24 oz



Personalized Hydration Plan



This plan is designed to help you as an athlete identify your hydration needs surrounding training and competition. This plan does not identify your specific hydration needs throughout the entire day, but by using the contained urine color chart you can start to recognize when you are properly hydrated (please note urine color can also be affected by certain supplements such as B vitamins).

Most athletes daily fluid needs are somewhere in the range of 0.5-1.0 oz per pound of body weight but this can vary widely based on weather, training, and sweat rates. Keep in mind, rapid weight loss during training periods could be attributed to inadequate hydration status.

Step 1: Weigh yourself without clothing immediately prior to a workout roughly 60 minutes in length. Record weight below.
 Weight = _____ lbs (Pre-Workout)

Step 2: Record any fluid consumption during the workout.
 Fluid consumed during workout = _____ oz consumed

Step 3: Wipe off excess sweat, remove sweaty clothing, and weigh yourself immediately following the workout. Record weight below.
 Weight = _____ lbs (Post-Workout)

Step 4: Subtract your post-workout weight from your pre-workout weight to determine weight lost during the workout and record below.
 _____ - _____ = _____ lbs lost during workout
 (Pre-Workout) (Post-Workout)

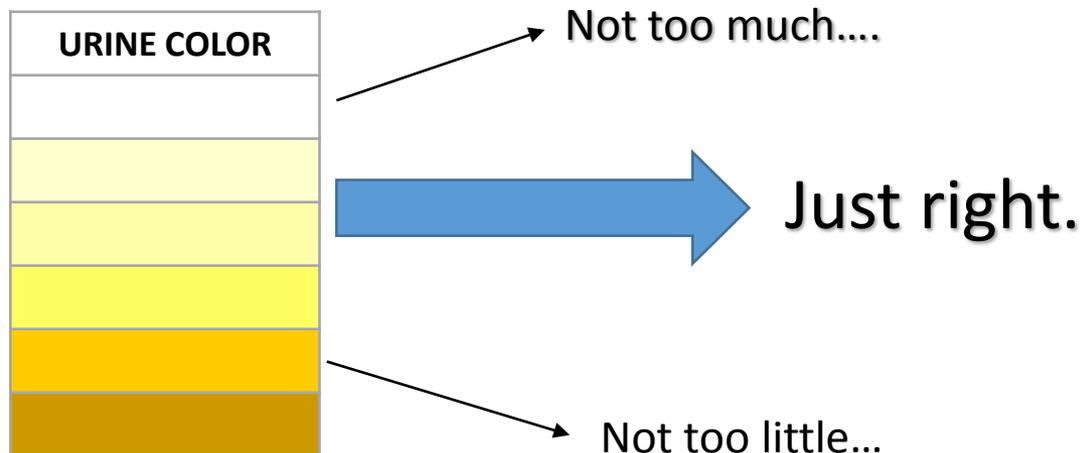
Step 5: Convert lbs to oz to determine fluid lost. (1 lb = 16 oz)
 _____ * 16 = _____ oz lost during workout
 (lbs lost during)

Step 6: Account for any fluid consumed during the workout by adding it to what you lost.
 _____ + _____ = _____ oz TOTAL lost during workout
 (oz lost during) (oz consumed)

Note: If your workout was longer than one hour then you must divide the total oz lost by the number of hours (ex. For a 2 hour workout divide the total lost by 2); otherwise, the total lost is your sweat rate per hour.

Daily Hydration

- Most active individuals need 0.5 – 1 oz per lb
- Varies based on workouts, environmental factors, genetics
- Keep *desirable* fluids accessible throughout the day
- Keep sports drinks for workouts or strenuous outdoor work in the heat (not general fluid intake)
- Monitor urine color



Fueling Around Races and Workouts

Timing your fueling needs

Race & Workout Fueling

3-4 Hours Before	30-90 Minutes Before
<ul style="list-style-type: none">-“Balanced” meal – carb, fat, protein-Limit high fiber or fat content if experience GI problems-Hydrate → 16-20 oz over 1-2 hours or ideally individual plan	<ul style="list-style-type: none">-Carbohydrate-rich snack (strength workouts may benefit from some protein)-Avoid high fat or fiber-Hydrate as necessary → 8-12 oz or per plan-Use sports drinks or salty items if heavy sweater or hot environment

Example:

Fig Newtons, sports drink, English muffin with jam, banana, yogurt, bagel

Practice your plan!

Workout-specific Pre-Fueling

- Length of workout
 - <75 minutes: Carbs before not as important
 - >75 minutes: Carbs before important
- Time of day
 - Morning: Challenge to eat before workout
 - Afternoon: May have missed meals/snacks with daily schedule
- Type of workout
 - High intensity: Carbs before important
 - Low intensity: Carbs before not as important (unless length of workout)
- Gastro discomfort
 - Eating before may or may not bother stomach – individualized

Not eating carbs directly before a workout may contribute to using more fat for energy – okay with low intensity & shorter workouts. This requires adaptation. Pay attention to fatigue.

Race & Workout Fueling

During (Workout > 60 minutes)

- Electrolytes
- Hydrate based on sweat rate (or 4-8oz per 15 min)
- Sports drinks, gels, chews (for workouts greater than 60 min or if didn't fuel well *before*)
- Sports drink may be most practical (carb, electrolytes, fluid)

Example:

Sip water bottle at the gym, carry small handheld bottles on long runs (refill at fountains)

Practice your plan!

Length	Carbohydrates (g)	Example
< 90 minutes	None (or sips)	n/a
90 minutes – 2.5 hours	30-60 g/hr	16 oz sports drink + 1 gu (hourly)
> 2.5 hours	60-90 g/hr	24 oz sports + 1 cup pretzels

Race & Workout Fueling

Recovery (within 30-60 minutes)

-Roughly 0.5 grams carbohydrate per lb of body weight (endurance)

-20-30 grams protein

-20-24 oz fluid for every lb lost

- Critical for muscle recovery and immune system
- Fluid and electrolytes important
- Endurance vs strength only changes carb recommendation

Ex. 150 lb runner

8 oz chocolate milk + ½ PB&J sandwich + apple

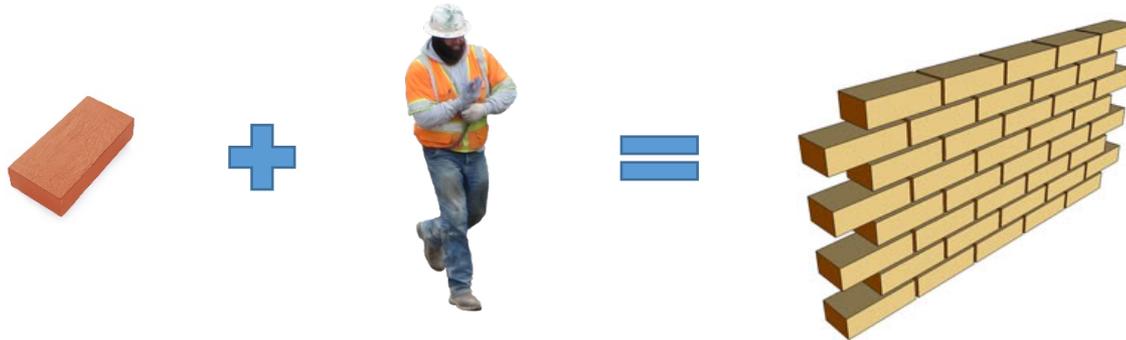
Sample Daily Plan

<i>(150lb Runner)</i>	MEAL PLAN
Pre-Workout (run)	1 English muffin 1 tsp jam <i>Water</i>
Post-workout/Breakfast	2 eggs 1 cup oatmeal made with milk 1 cup melon
Lunch	Black bean veggie burger in whole wheat pita Spinach, onions, tomatoes ½ Avocado 1 orange
Afternoon Snack/Pre-workout	1 banana Small handful almonds
Post-workout	12 oz chocolate milk Pear
Dinner	4 oz salmon (made with olive oil) 1 large sweet potato (with 1-2 tsp butter) 1 cup steamed broccoli

Body Composition & Weight

Creating healthy change

Healthy Weight Gain



Protein (amino acids) + Strength work Energy (carbs, fats) =



A ton of “bricks” doesn’t build muscle – it requires carbs to do the strength work

Carbs SPARE protein from being used as energy

Healthy Weight Gain

- Roughly same protein intake
- Increase carbohydrates, healthy fats
- Eat frequently throughout the day (every 2-3 hours)
- Add calories to foods/meals you already like
 - Extra peanut butter, additional slice of bread, double rice in a burrito
- Look at genetics

Healthy Weight Loss

- Slightly higher protein intake
- Decrease carbohydrates, time intake around a workout
- May decrease fats
- Avoid skipping meals – aim for something every 3-4 hours
- Look at genetics

Dietary Supplements

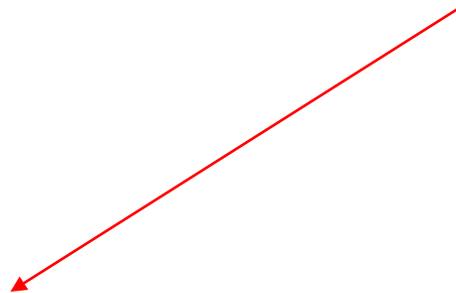
Being a smart supplement user



Dietary Supplements Defined

A dietary supplement is “a product (other than tobacco) intended to supplement the diet that bears or contains one or more” **dietary ingredients**.

21 USC 321(ff)



- A vitamin, mineral or amino acid (whether a concentrate, metabolite, constituent, extract, or combination)
- An herb or other botanical (whether a concentrate, metabolite, constituent, extract, or combination)
- Enzymes, organ tissues, glandulars

It CANNOT contain a drug as defined by the FDA.

Regulation



- Variety of inspection and safety programs conducted by FDA, USDA, and state/local inspection teams

← This is regulated differently than this. →



- Company is responsible for safety and substantiation of claims
- No pre-market approval or testing by FDA
- FDA responsible for proving *unsafe* once on the market



One cannot subsist on supplements alone...





Concerns

- Contains ingredient NOT on the label
- DOES NOT contain ingredients listed on the label
- Toxins/chemicals from manufacturing process
- Scientifically unsubstantiated health claims
- Medication interaction
- \$\$\$\$

Only take a supplement if both:

Safe

- Stick with 3rd party tested supplements
 - NSF Certified for Sport
 - USP
 - Informed Choice



Certified for Sport®



- Talk to a dietitian or physician before starting a supplement
- USADA Supplement 411:
<http://www.usada.org/substances/supplement-411/>
- Human Performance Resource Center:
<http://hprc-online.org/dietary-supplements/opss>

Effective

- Talk to a dietitian
- Human Performance Resource Center:
<http://hprc-online.org/dietary-supplements>
- Office of Dietary Supplements:
<https://ods.od.nih.gov/factsheets/list-all/>
- Consumer Labs, research studies
- Few researched, effective (safe) supps:
 - Caffeine
 - Creatine
 - Whey protein
 - Leucine
 - Beta-alanine
 - Sodium bicarbonate
 - Vitamins/minerals (if deficient)



Questions?

Lauren Trocchio, RD, CSSD, LD

Survey

It is requested you go to the link below and complete the short 7 question survey.

- <https://surveys.uscg.mil/Community/se.ashx?s=6F20F7743AEEFAEA>

If you have any questions or concerns about this webinar, or the CG Health Promotion Program, please do not hesitate to contact me. Thank you for all that you do.

Sincerely,

Tim Merrell

202-475-5146

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