# FINDING YOUR FUEL

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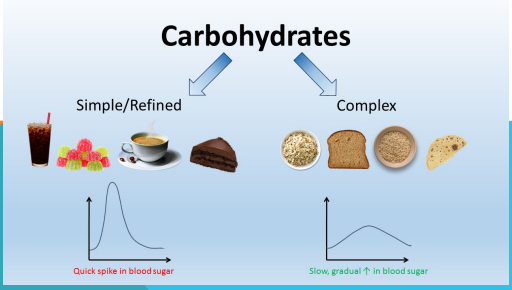
## OUTLINE

- Overview of macronutrients and definitions
- Fueling recommendations
- Pre-, during-, post-race fueling guidelines
- Finding your fuel

## CARBOHYDRATE

- Primary and most efficient fuel source for exercising muscles and exclusive fuel of the brain
- Increase fluid absorption, keep you focused, delay fatigue
- Sources: starches and sugars (complex vs. simple)
- Goals:
  - Adequate intake pre-, during-, post exercise
  - Avoid using protein for energy

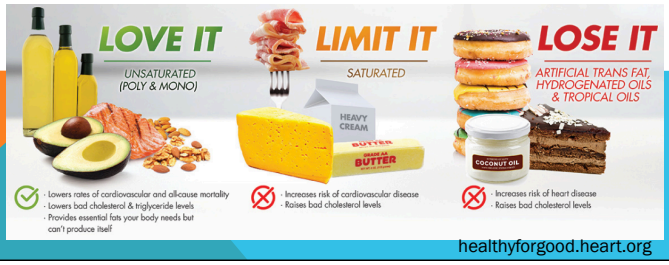



## PROTEIN

- NOT a preferred fuel source for runs
- Protein is STRUCTURE: tissues, enzymes, hormones, antibodies
- Most beneficial when distributed throughout the day (0.3 g/kg)
- Goals:
  - Adequate intake to avoid lean body mass loss

## FAT

- Main energy source for long-term low intensity aerobic activities or if carbohydrate is inadequate
- Fat is ESSENTIAL: Maintains body temperature, supports immune function, cushions and protects organs, facilitates nerve transmission, assists in vitamin absorption
- Goals:
  - Adequacy depends on intake levels of carbohydrate and protein intake
  - Choose unsaturated fats more often than saturated fats

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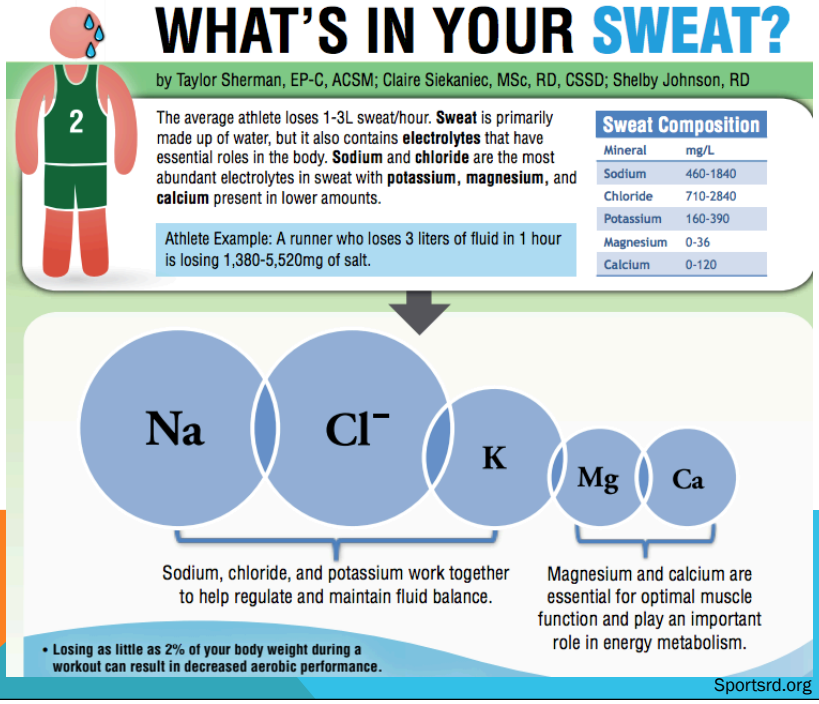


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## FUELING RECOMMENDATIONS PRE RUN

- 1 –4 hours pre run: 1 – 4 grams carbohydrate per kg body weight
  1 pound = 2.2 kilograms

Goals:
- Carbohydrate-rich
- Low fat
- Low fiber
- Moderate protein

| Pre /Post Workout | Calories kcal | Carbs g | Fat g | Protein g |
|---|---|---|---|---|
| Tropicana Trop50 - No Pulp Calcium Orange Juice, 12 oz | 80 | 20 | 0 | 1 |
| Quaker - Real Fruit Medleys Summer Berry, 1 package | 250 | 51 | 3 | 8 |
| Orowheat - 100% Whole Wheat English Muffin, 1 muffin = 65 gms | 150 | 29 | 2 | 6 |
| Banana - Banana Sliced, 0.25 cup ( 166 G) | 33 | 9 | 0 | 0 |
| Market Pantry - Pure Honey, 1 Tbsp | 60 | 17 | 0 | 0 |
| Quaker - Instant Oatmeal Maple & Brown Sugar Bowl, 2 bowl 48 g | 360 | 72 | 5 | 8 |
| Add Food \| Quick Tools | 933 | 198 | 10 | 23 |

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## FUELING RECOMMENDATIONS DURING RUN

- 30-60 grams carbohydrate per hour after the first hour

- 1-2 hr → 30 g/hr, 2-3 hr → 60 g/hr, 2.5+ hr → ≤90 g/hr
- Start low and go slow
- Eating is training!
- Goals:
  - Fuel early and often – set alerts on your watch or phone
  - **NEVER** try anything new on race day

## FUELING RECOMMENDATIONS: RECOVERY

3 R's of Recovery nutrition:

- **Rebuild** with protein: 0.3 grams/kilogram body weight
  (about 20-25 grams for most people)
- **Refuel** with carbohydrate
- **Rehydrate** with fluids

Goal:

- Within 1 hour of exercise,
  ASAP if next training session same day

## FINDING YOUR FUEL

Things to consider

- Race distance
- Gastrointestinal issues
- Chew vs. drink
- Preference for sweets (flavor fatigue is real!)
- Ingestion rate
- Caffeine?
- Fuel/water belt?
- Isotonic (amount of water needed to digest product)

## CARBOHYDRATE SOURCE

- Look for "-ose" in ingredients
- Sucrose: GI upset, bonking, hypoglycemia
- Fructose: can slow down absorption of other carbohydrate in the gel
- Glucose: quick energy, possible GI upset
- Maltodextrin: quickly absorbed type of carbohydrate, dissolves well in water (isotonic at 9g/oz)
- Superstarch: slow releasing carbohydrate, generally well tolerated

## PRODUCT MATCHING: GU GEL

- 100 cals, 20-23 g carb, 0 g protein
- 70-80% maltodextrin
- 20-30% fructose
- Amino acids: GU – leucine, isoleucine
- Amino acids: Roctane – leucine, isoleucine, taurine, valine, beta-alanine
- Caffeine (some flavors)
- Electrolytes: sodium, potassium, calcium
- Isotonic: GU – 175 ml (~6 oz)
- Isotonic: Roctane – 201 ml (~7 oz)

Is it for you: do you like sweets?

## PRODUCT MATCHING: HAMMER GEL

- 80-100 cal, 21-22 g carb, 0 g protein
- ~95% maltodextrin
- ~5% fructose
- Amino acids: leucine, isoleucine, valine, alanine
- Caffeine (some flavors)
- Electrolytes: sodium, potassium
- Isotonic: 115 ml (~4 oz)

Is it for you: slightly easier to digest than GU


## PRODUCT MATCHING: STINGER GEL

- 100 cal, 24-27 g carb, 0 g protein
- Chews: 160 cal, 39 g carb, 1 g protein
- Honey (glucose + fructose)
- Electrolytes: sodium, potassium
- B vitamins
- Isotonic: 477 ml (16 oz)

Is it for you: do you like sweets? Do you have GI issues?
Can you drink a lot of water during your race?

## PRODUCT MATCHING: HUMA

- 100 cal, 21-22 g carb, 1 g protein, 0.5-2 g fiber
- Carb source: evaporated cane juice, fruit puree, brown rice syrup (glucose-fructose)
- Fiber content from chia seeds slows carbohydrate absorption
- Electrolytes (energy plus only): sodium, potassium, calcium
- Caffeine free → 25 mg, 50 mg
- Isotonic: 356ml (12 oz)


Is it for you: do you prefer real fruit flavors? Like sweets?

Prefer thinner gel consistency? Are you a purist?

## PRODUCT MATCHING: NUUN

- 60 cal, 15 g carb
- Most products primarily electrolytes

Is it for you: are you running a very long distance? Prefer to drink your carb? Willing to wear hydration belt? Do you have GI upset? Are you running in hot weather?

## PRODUCT MATCHING: UCAN

- 80 cal, 21 g carb (Protein: 100-200 cal, 18-33 g carb, 7-13 g protein)
- "SuperStarch" complex carbohydrate – hydrothermally modified waxy maize (corn starch)
- Vitamin C (some flavors)
- Electrolytes: sodium, potassium (content varies)


Is it for you: do you prefer drinking your nutrition?

Possibly helpful for exercise-induced hypoglycemia.

Do you carry hydration belt?

Possibly helpful with GI issues (comes in plain flavor)

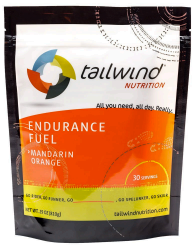
## PRODUCT MATCHING: SKRATCH

- 80 cal, 21 g carb, 0 g protein (500 ml/ 16 oz)
- Cane sugar (sucrose), dextrose (glucose)
- Electrolytes: sodium, potassium, calcium, magnesium
- Vitamin C


Is it for you: do you have GI issues? Prefer to drink your nutrition over gels/chews? Do you prefer a hot beverage?

## PRODUCT MATCHING: TAILWIND

- 100 cal, 25 g carb
- Dextrose (glucose), sucrose
- Electrolytes: sodium, potassium, chloride, magnesium, calcium
- Caffeine: certain flavors




Is it for you: Do you prefer to drink nutrition over chews/gels?

Does sugar give you GI issues?

Do you wear a hydration pack?

## FUELING WITH FOODS

Things to consider

- Length of race
- GI tolerance
- Ability to eat and run

## WHOLE FOOD OPTIONS

Guidelines

- Carbohydrate-rich, relatively low in protein and fat
- Choose foods easy to chew/swallow…
- 2 fig newtons: 198 cal, 40 gram carb
- 1 small box raisins: 123 cal, 34 gram carb
- 1 medium peeled apple: 77 cal, 21 gram carb
- 1 large banana: 121 cal, 21 gram carb
- ½ cup pretzels: 100 cal, 24 gram carb
- 1 fruit "squeeze pouch": 60-80 cal, 24+ gram carb

## TROUBLESHOOTING GI UPSET

- Slow ingestion rate start with 15 grams per hour and slowly increase
- Consume gels/chews with water
- Never take a gel/chew with a sports drink (sugar bomb)
- ALWAYS practice with your product prior to race day
- Try a caffeine free-product
- Check amount of vitamin C in your product
- Choose a product with main carbohydrate source maltodextrin
- Check protein and/or fat content of fueling product

## BOTTOM LINE: FINDING YOUR FUEL

Eating is training: practice, practice, practice!

Numbers to remember:

- 1 –4 grams carb/kg 1 –4 hours before runs lasting longer than 60 minutes
- 30 – 60 grams carb per hour after the first hour in runs lasting longer than 60 minutes
- 3 R's of Recovery: Refuel (carb), Rebuild (protein - 0.3 g/kg), Rehydrate (fluid)

Things to consider:

- Length of run
- What are they serving on course?
- Do you want to chew or drink your nutrition?
- Logistics: how will you carry it?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