PERFORMANCE FUELING:  
SOCcer  
TIPS AND APPLICATION

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LEARNING OBJECTIVES:

- At the conclusion of this talk, the learner will be able to identify:
  - Importance of quality carbohydrate sources, hydration, electrolytes
  - Recovery
  - Nocturnal repair
  - General nutrition fueling guidelines for preseason, competition, off season
QUALITY CARBOHYDRATE
GENERALLY: HIGH FIBER, LOW SUGAR

Processed foods = *Increased inflammation*

INFLAMMATION = *Reduced performance*
FUEL QUALITY: ANTI INFLAMMATORY FOODS

1. Plants: The **stronger** the COLOR or TASTE: the more potent

2. Spices/herbs: Include when feasible. Don’t overdo!

3. Healthy fats: Plant fats: olives, avocado, nuts, seeds
   - Also: foods made from plants such as hummus, guac, nut butters, pesto
   - Coconut oil is plant based but is highly saturated, **not** recommended for regular use

**Omega 3 fats**: highly desirable. Research in-process about omega 3 fats/brain injury
   - Tuna, wild salmon, sardines
   - Flax seeds, chia seeds
   - Be careful with supplements!
# QUALITY CARBOHYDRATE EXAMPLES

*EAT CLOSE TO “ORIGINAL FORM”*

## TOP TIER
- Whole grain breads, wraps, tortillas
- Whole grain crackers
- Whole grain pasta
- Whole grain cereals
- Beans, lentils, peas
- Sweet potatoes, starchy vegetables
- Quinoa
- Bean pastas
- Oatmeal

## ACCEPTABLE
- Regular bread
- Pretzels
- Crackers
- Pasta
- White potatoes
- Corn,
- Non sugary cereals
FOOD AND FOOD RELATED ITEMS WHICH MAY CONTRIBUTE TO INFLAMMATION

- Added sugars
- Processed fats
- Artificial ingredients: coloring, dyes, flavoring, preservatives
- Plastics
HYDRATION BALANCE

- Obtain body weight to estimate fluid losses
  - IMPORTANT! Correct losses within 2 hrs
- Consume 20-24 oz of fluid for every pound lost
- Beverage should contain
  - Water to restore hydration status,
  - Carbohydrate to replenish glycogen stores,
  - Sodium, potassium, to accelerate re-hydration. Magnesium and calcium sources desirable
SAMPLE HYDRATION PLAN

7:00 AM: “prehydrate” for the day: at least 16 ounces water

7:30 AM: at least 10-20 ounces water, juice, or milk. Eat salty foods

8:00-11:00 AM: at least 10-20 ounces water, add high fluid snacks (yogurt, smoothy, fruit)

11:30 AM: at least 20 ounces water, milk, juice; eat salty foods

12:00-2:00 PM: at least 10 ounces water to pre-hydrate for afternoon

20 minutes pre-match/practice: 10 ounces water

Halftime: 8-10 ounces sports beverage and 8-10+ ounces water

Post: 20 ounces water or diluted sports beverage for every pound lost.

8-20 ounces Chocolate milk for rapid refueling/repair

6:30 PM: Dinner: at least 20 ounces water, juice, or milk with dinner, have salty food

7:30-10 PM: 10-30 ounces water or other fluids to pre-hydrate for the next day

If fluids disrupt sleep: switch to high fluid snacks such as yogurt, cereal with milk
Sodium loss: #1 source of cramping per current research

- Increase dietary sodium consumption during high heat/humidity
- Food sources: added table salt +
  - salsa,
  - pickles,
  - condiments,
  - soy sauce
- V-8 and Tomato juice (also excellent for potassium)
ELECTROLYTES
INCLUDE FOOD SOURCES DAILY

- **Calcium:** Milk, soymilk, broccoli, tofu
- **Magnesium:** Nuts, whole grains, lean meat
- **Potassium:** Almost every fruit/vegetable

*Can be obtained from eating food!*
ALTERED NEUROMUSCULAR CONTROL THEORY

- Theory: As the muscle becomes fatigued:
  - Disruption of peripheral receptors, resulting in
    - *Increased excitatory* (e.g. muscle spindle) signals
    - *Decreased inhibitory* (e.g. Golgi tendon organ) signals
  - This abnormal firing of motor neurons can initially present as muscle twitching
  - If muscle contraction continues: cramping
Products which affect ion channels in nervous system have been shown to be effective in reducing cramping by influencing nerve to stop firing.

Brand names:
- Hot Shot

**NOTE:** *does NOT address electrolyte loss!*
POTASSIUM REPLACEMENT FOR CRAMPING

- Theory of potassium depletion within muscle as being a primary driver of cramping
- Brand names: Krampade
POTASSIUM DEPLETION THEORY:

FOUR KEY CONCEPTS:

1) Na⁺ goes into the muscle and K⁺ goes out, contraction occurs.

2) Most of the K⁺ goes back into the cell, but repeated contractions from vigorous or repeated contractions, reduces muscle K⁺.

3) When this occurs, cramping occurs.

4) Krampade shifts the equilibrium to replace K⁺ in the muscle, uncramping it.
RECOVERY IMPORTANCE

- Including carbohydrate and protein helps with resilience:
  - Restoration of glycogen
  - Reduction of creatine kinase (marker of muscle damage)
- Studies suggest that post-exercise protein activates mTOR, an enzyme that turns on muscle-building pathways.

Remember:

- Protein helps repair and build muscle
- Carbohydrate will refuel muscle.

Both Carbohydrate and Protein are necessary!
First window of recovery: immediately post activity:

Current guidelines for refueling after depleting workouts:

0.2 grams protein/lb + 0.5-0.6 grams CHO/lb

Example (150 lb athlete): 20-30 grams protein + 75-90 grams CHO

Food examples:

- 24 ounces chocolate milk
- 8 ounces vanilla yogurt + half cup granola + banana
- 2 ounces lean meat on bagel with mustard + 8 ounces OJ

Don’t get obsessed about the exact ratio; pay more attention to the concept of consuming more calories from carbs than from protein.
Second wave of repair:

Time to add fiber, healthy fats, anti-inflammatory components:

- Include vegetables
- Include healthy fat sources
- Still focus on lean protein and complex carbohydrates
- Avoid filling up on inflammatory fats (fried/processed) and lots of added sugar
**KNOWN**: Protein is lost overnight

**Emerging Research**: Muscle protein losses may be reduced by **CONSUMING PROTEIN PRE-SLEEP**

- Cup of fortified milk
- ¾ cup of greek yogurt
- ½+ cup cottage cheese
Tissue repair and glycogen restoration is occurring throughout day and during night:

**Standard guidelines of eating:**
- Start within the first hour of arising, AFTER hydration
- Eat every 3-5 hours
- Avoid large feedings within 2 hours of sleep

**Simple guidelines for feedings:**
- Goal of at least 2-3 quality components at each feeding.
  - Bonus if a plant is included!

Note: If athlete is on appetite-suppressing medication: especially important to fuel pre-medication.

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PORTABLE SNACKS

- Nut and dried fruit packs
- PB packs or almond butter packs
- Yogurt or yogurt parfaits
- Hummus cups with pretzels
- Triscuits or other whole grain crackers
- Fruit
- PB sandwich on quality bread
- Shelf stable milk
- String cheese
- Quality snack bars: look for real food ingredients
- For sodium replacement: tomato juice, jerky, miso broth
GENERAL FUELING GUIDELINES

PRE SEASON

Physical Focus: Strength, endurance, skills

Fueling Focus: Develop and maintain fueling habits:

- **Hydration**: build habits of hydrating throughout the day
- **Fuel quality**: include anti-inflammatory fuel: plants/healthy fats
- **Consistent fueling**: eating throughout the day, avoiding large gaps in fueling
GENERAL FUELING GUIDELINES

COMPETITION

**Physical Focus:** Maintain strength, improve skills, resilience

**Fueling Focus:** Emphasis on fueling for performance and recovery

- Quality carbohydrate: whole grains and plants
- Because recovery is occurring 24+ hours: include quality food throughout the day; avoid large gaps in fueling
- Be prepared: have restoration fuel available after workouts/matches
OFF SEASON

**Physical Focus:** Rest and Recovery from season.
- If multi-sport: continue with performance fueling patterns
- OK to lose weight if needed (and done correctly)

**Fueling Focus:** Overall reduction in feedings if not engaged in intense training
- Less need for carbohydrate due to reduction in expenditure
- Reduce snacks/multiple feedings
- Avoid shifting into complacency with eating

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Per tolerance of athlete:

Must include hydration which includes carbohydrate and electrolytes:
- Sports beverages and water

Easily digested carbohydrate/electrolyte sources:
- Pretzels or PB pretzels
- Raisins
- Possibly: chocolate milk
- Possibly: new potatoes with salt
SNACK IDEAS

- 100% whole grain bread with PB or almond butter + raisins
- Bananas
- Shelf-stable milk boxes
- Yogurt tubes
- PB pretzels
- Jerky for sodium
- Trail mix
- Triscuits
- Peanuts
- Good quality bars (ingredient panel)
- String cheese + fruit
- V-8 for electrolytes
PUTTING IT ALL TOGETHER
FOR FUELING SUCCESS: HAVE A PLAN!

- **DAILY**: start hydrating and fueling within the FIRST HOUR
- **EAT**: every 2-3 hours
- **INCLUDE**: quality/anti-inflammatory fuels at meals and snacks
- **MONITOR**: weight changes pre/post match; replenish fluid
- **FUEL**: pre/post workouts
- **PRE-SLEEP**: appropriate snack
- **INCLUDE**: sources of
  - **Sodium** (iodized salt, soy sauce, jerky, tomato juice, most condiments, miso, soups)
  - **Potassium** (tomato, citrus, potato, plants)
  - **Calcium** (milk, soymilk, greens, tofu, yogurt, cheese)
  - **Magnesium** (whole grains, nuts, seeds, lean meat)
QUESTIONS?

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