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# **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



# ELECTROLYTES

## SODIUM

### **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

# ALTERED NEUROMUSCULAR CONTROL THEORY, CONT.

- 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:

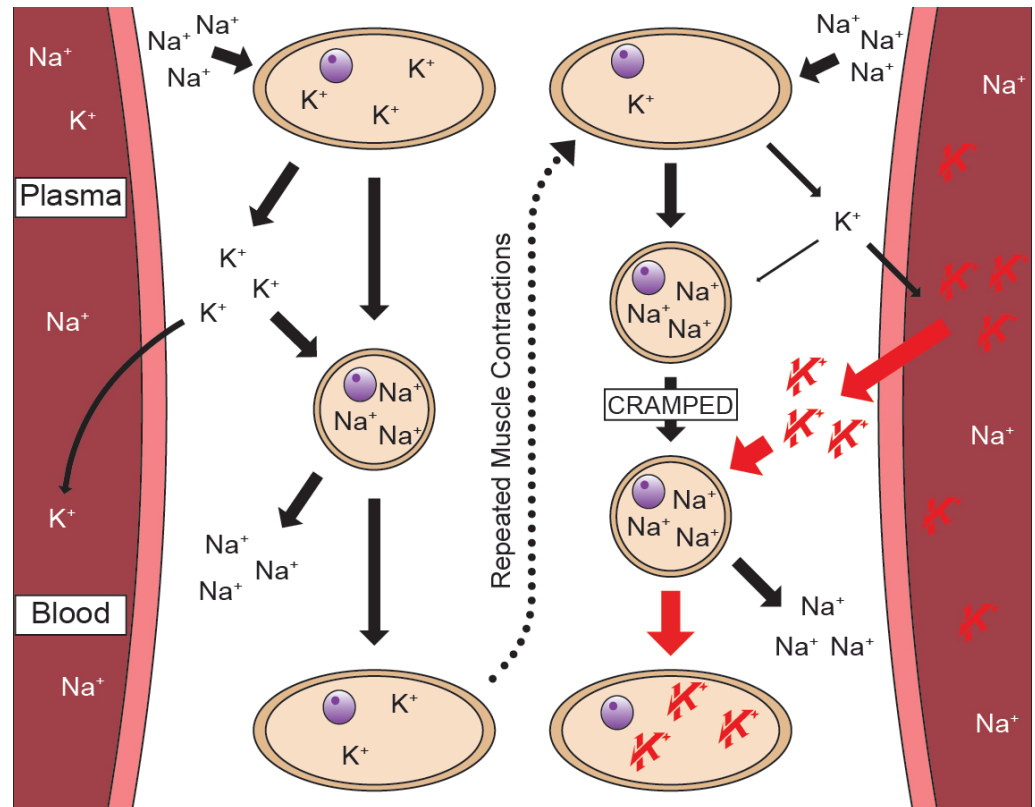
## FOUR KEY CONCEPTS:

1)  $\text{Na}^+$  goes into the muscle and  $\text{K}^+$  goes out, contraction occurs.

2) Most of the  $\text{K}^+$  goes back into the cell, but repeated contractions from vigorous or repeated contractions, reduces muscle  $\text{K}^+$ .

3) When this occurs, cramping occurs.

4) **Krampade** shifts the equilibrium to replace  $\text{K}^+$  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!**

# RECOVERY:TWO WINDOWS

**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



# RECOVERY: SECOND WINDOW

- 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

# NOCTURNAL REPAIR

**KNOWN**: Protein is lost overnight

## **Emerging Research**:

Muscle protein losses may be reduced by

### ***CONSUMING PROTEIN PRE-SLEEP***

- Cup of fortified milk
- $\frac{3}{4}$  cup of greek yogurt
- $\frac{1}{2}+$  cup cottage cheese

# FUEL THROUGHOUT DAY

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.**

# 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

# GENERAL FUELING GUIDELINES

## 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

# FUELING DURING COMPETITION

## *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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