# What is the Young Athlete Eating and Drinking to have Optimal Performance?

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# Objectives

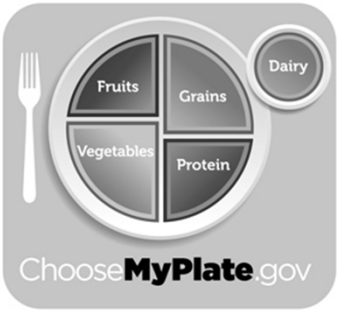
- Describe the five most common myths in sports nutrition for child and adolescent athletes with recommendations for the school nurse and trainers
- Discuss how to fuel young athletes over the course of the day with nutrient-rich meals and snacks
- Identify appropriate pre, during and post-workout snacks for child and adolescent athletes to help fuel up and recover from exercise
- Differentiate when water and sports drinks are appropriate during sport and training and how much is required
- Recognize challenges to proper hydration for child and adolescent athletes and how to combat those with easy strategies

## 5 Most Common Sports Nutrition Myths for Young Athletes

- Young athletes should not be forced to eat and drink before and after exercise
- Sports drinks are full of sugar and young athletes don't need them
- Post-workout drinks/shakes have too much sugar
- Sodium (salt) is bad
- Dairy is not good for you

# Sports Nutrition Basics

- **Fuel frequently**
  - Goal is to eat smaller, more frequent meals to keep energy levels up over the course of the day
  - Example: Breakfast-Snack-Lunch-Post Workout Snack-Dinner-Snack
- **Nutrients that athletes need**
  - Carbohydrates
  - Protein
  - Fat
  - Fruit
  - Vegetables
  - Low-fat dairy



## Carbohydrate Recommendations

- Carbohydrate Intake
  - Due to the lack of research, it is unclear whether young athletes need the same carbohydrate intake as adult athletes due to a decrease in functioning of the glycolytic pathway
  - General recommendations is 50% of total energy intake from quality carbohydrates
    - Young athletes should limit processed sugars and snack foods as an energy source throughout the day
  - During exercise, research supports that refined carbohydrate can still be helpful
    - Sports drinks, energy bars, gus, etc.

## Carbohydrates

- **Purpose:** Body's "choice" for energy; primary energy contributor during exercise
- **Goal:** Have some carbohydrate at every meal and snack to maintain energy levels
- **Types of carbohydrates**
  - Simple: jelly, cookies, hard candy, juice
  - Complex: bread, pasta, cereal, bagels
- Whole grains and wheat products
- Fruits
- Vegetables
- Dairy products
- Sports drinks/gels/goos/blocks

## Carbohydrates: Best Choices

- **Why grains?**
  - Rich in carbohydrates, B vitamins, give lots of energy
- Should be the **largest** part of your diet
- **Best choices**
  - Wheat bread, oat bread, wheat bagels, wheat English muffins, wheat tortillas
  - Cereals: Total, Shredded Wheat, Cheerios, Granola
  - Oatmeal, Cream of Wheat
  - Brown Rice/Wheat or Multi-grain Pasta
  - Wheat crackers/whole grain granola bars

## Protein & Fat Recommendations

- Protein Intake
  - Dietary recommendation is 0.8-1.0 gm/kg BW for non-active adolescents
  - Upper limit for protein intake for adolescent athletes in training is 1.7 gm/kg BW
- Fat Intake
  - Though young athletes use more fat as fuel during exercise, there appears to be no greater need for higher fat intake
  - Dietary recommendation is the same as adults, 20-35% of total daily energy intake
  - High fat intake before exercise tends to reduce the magnitude of growth hormone secretion naturally produced in young athletes during exercise

# Protein: Best Choices

- **Purpose:** Build/repair muscles, hair/nail growth, boosts immunity, RBC production
- **Goal:** Have some carbohydrate at every meal and snack to maintain energy levels
- Lean meat
  - Chicken, turkey, lean ham, lean red meat, fish, tuna, turkey bacon and turkey sausage
  - Take the skin off of meat
- Eggs and egg whites
- Low-fat dairy products
  - Milk, cheese, yogurt, cottage cheese

- Whey protein powders and smoothies/shakes made with it…whey protein absorbs very quickly
- Nuts, seeds, peanut butter, beans, soy foods

# Protein: Best Choices

- Low-fat dairy is a great way to get quality protein as well as calcium, Vitamin D and potassium in young athletes
  - 90% water which helps replace fluids and rehydrate the body
  - Contains calcium, Vitamin D and phosphorus to help promote, maintain and build strong bones
  - Contains protein to reduce muscle breakdown
  - Contains carbohydrate to fuel muscles during exercise and help muscles recover after exercise
  - Contains potassium which helps with fluid and mineral balance and muscle contraction
  - Contains B vitamins that help convert food to energy to fuel working muscles

# Fat: Best Choices

- **Saturated Fats: "Bad Fats"**
  - Fried foods, pastries/baked goods, creamy foods
- **Unsaturated Fats: "Good Fats"**
  - Peanut butter, almond butter, nuts, seeds
  - Olive oil and Canola Oil
  - Avocado
  - Flaxseed or flaxseed oil
    - Can buy milled, as oil, or in breads and cereals
  - Fats in fish like salmon

- **Remember** that you get some fat in dairy products, meats, whole eggs, and energy bars/shakes

# Start the day with breakfast

- **Cheap, Quick On-the Go Breakfasts**
  - Whole wheat bagel w/2 spoons peanut butter, banana & 1 bottle 2% milk
  - Energy bar, banana &1 bottle 2% milk
  - Peanut butter & jelly sandwich on wheat bread, Yoplait 2x Protein Yogurt and 8 oz low-fat milk
  - Peanut butter crackers, 1 cup trail mix, 1 bottle 2% milk
  - Smoothie w/fruit, milk & whey protein powder
  - Nature Valley Granola bar & add peanut butter on top, string cheese, 1 bottle 2% milk
  - Quaker Oatmeal On-the-Go bar, Individual bag of nuts, 1 bottle 2% chocolate milk

# Brown Bag Lunches

- Peanut butter and jelly sandwich on 100% whole wheat bread, 6 oz low-fat Greek yogurt with ½ cup berries, baby carrots, Fiber One granola bar
- Turkey and 2% cheese roll-ups, 1 serving 100% whole wheat crackers, baby carrots and ¼ cup hummus, 1 fruit and a Kashi TLC cookie
- 100% whole wheat tortilla with ½ cup black beans, ½ cup brown rice and 1 slice 2% cheese, celery and Jif-to-Go Natural peanut butter for dipping, 1 cup fruit
- 6 oz low-fat Greek yogurt with ½ cup granola and a sliced apple for dipping, an individual pack nuts, a string cheese, and 2-3 baby skewers with roasted veggies

# Fueling Snacks

- Energy bar
- Individual bag trail mix
- Beef jerky and a banana
- Granola bar and nuts
- Whole wheat crackers and string cheese
- Yoplait 2x Protein Yogurt and fruit
- Hummus and whole wheat pita bread/pita chips
- Apple and peanut butter
- Popcorn and string cheese
- Peanut butter bites
  - Stir ½ cup peanut butter and ¼ cup honey together
  - Stir in 1 cup oats and ½ cup whey protein powder
  - Roll into 20-22 balls and refrigerate
  - Approx 70 calories, 7 carb, 2 fiber, 3 protein, 3 fat each

## Healthy Convenient Store Snacks

- **7-11's and Quick Trips offer the most options**
- Peanut butter crackers/peanut butter filled pretzels
- Individual bags of trail mix or nuts & a fruit
- Whole grain granola bars & string cheese/nuts
- Box of whole wheat crackers & string cheese
- Protein bar & banana/milk
- Turkey/ham and cheese sandwiches/wraps & baked chips/ fruit cups
- Yogurt & fruit parfaits & a bag of nuts
- Ready-to-drink Protein Shake & a fruit/granola bar
- Add milk/chocolate milk to any snack to increase calories and protein

## Pre-Exercise Meal Timing

- **How much time should I allow for digestion of food before exercise?**
  - Allow 3-4 hours for large meal
    - Meat, pasta, vegetables, salad, roll
  - Allow 2-3 hours for smaller meal
    - Sandwich, crackers/baked chips, fruit
  - Allow 1-2 hours for a blenderized meal to digest
    - Smoothie, protein drink/shake

- **Carbohydrate snack 30 minutes before exercise provides "energy burst" for performance**
  - 50-70% carbohydrate, low-moderate protein
  - Granola bar, fruit, peanut butter crackers, etc.

# Pre-Exercise Eating

- **Pre-exercise meal**
  - High carbohydrate
  - Low in fat & fiber
    - These slow down digestion
  - Moderate protein
  - Combine protein + carbohydrate
  - Plenty of fluids

- **Immediate Pre-exercise Snack**
  - 30 minutes before workout/game
  - High carbohydrate, small amount of protein to provide you with a boost of energy

# Early Morning Training

- **Lots of carbohydrate; more bland foods**
- **Good choices for early morning:**
  - Shake with carbohydrates & some protein
    - Shake powder mixed with water or skim milk, fruit, low-fat Greek yogurt, ice and water
  - Energy bar like Balance, Zone, Clif, Go Lean Crunchy, Luna, Power Bar Harvest/Triple Threat, Gatorade, Odwalla
  - Low-fat granola bar like Kashi crunchy/chewy, Nature Valley, Quaker Oatmeal Square
  - Fruit (i.e. banana, nothing very acidic)
  - Plain bagel or dry cereal/granola mix

# During Workouts

- **Carbohydrate-rich foods/drinks**
  - Carbohydrates digest the quickest & thus provide energy faster!
- Carbohydrate is needed for activity longer than one hour of consistent movement
  - 30-60 grams of carbohydrate per hour after the first hour of exercise
- Fluid need – match sweat losses
  - Consume 5-10 oz fluid every 15-20 minutes
  - Water and sports drink to replace electrolytes
- Avoid fat, protein, & fiber when exercising. These slow digestion & increase time in which energy is available to be used.

# Mid-Practice/Half-time Snacks

- **Carbohydrates, some protein, little to no fat**
  - Fruit/fruit snacks
  - Energy bars
  - Granola bars
  - Peanut butter crackers
  - Quarter PBJs if long practice/game
  - Dry cereal/trail mix with minimal nuts
  - Salty snacks
    - Goldfish, pretzels, crackers, animal crackers
  - Sports drink with snack

# Post-Exercise Nutrition

- **The three R's to post-workout recovery:**
  - **Replenish** carbohydrate burned during exercise
  - **Repair** damage done to lean muscle mass
  - **Rehydrate** the body to euhydration (normal)

# Post-Exercise 2-Hour Window

- **2-Hour Window of Recovery**
  - Your body has a specific time period, post-exercise, when you are able to more effectively take up nutrients
  - **0-45 minutes**
    - Best time to eat at least a snack as your muscles are more sensitive to absorb nutrients!
  - **45 minutes – 2 hours**
    - Try to get a normal-size meal or larger snack
- The window is the most important time to consume **plenty of carbohydrate, protein, & fluids** to replenish & refuel
- Essential if participating in twice a day training

# Post-Exercise Eating

- **Carbohydrate - Replenish**
  - Body NEEDS lots of carbohydrate post-exercise to replace energy stores
  - Simple carbs are best: milk, spots drink, fruit, juice
- **Protein - Rebuild**
  - Body needs some protein to start repairing tiny muscle tears
  - Provide some protein, ideally 5-10 grams, for young athletes
  - Ideally 20 gm protein immediately post-workout for older (teenage) athletes
    - Whey protein is the highest in BCAAs, specifically leucine which has been shown to re-synthesize muscle the fastest after a workout

# Post-Exercise Eating

- **Carb-Protein Combo Food Examples**
  - If you have products available:
    - Carb-Protein Ready-to-Drink Shake
      - Muscle Milk or EAS
    - Energy bar & Gatorade
    - Smoothie made with 1-2 cups low-fat milk, fruit, cold water, ice, and low-fat Greek yogurt

  - If you are on a budget:
    - 16-20 oz low-fat chocolate milk
    - Granola bar and 12 oz low-fat milk
    - Yoplait Greek 2x Protein Yogurt and a string cheese
    - 6 oz low-fat Greek yogurt with berries and honey

**Sample Morning Workout Day**
**Eating Example**

- Small pre-workout snack 5:30-6:30am
- Hydrate during workout
- Breakfast – within 30 minutes
  - If going to be longer, drink chocolate milk or small shake
- Mid-morning snack – 10:00am
- Lunch – 11:30am-1:00 pm
- Afternoon snack – 3:30-4:30pm
- Dinner – 6:00-7:30 pm
- Evening snack – 9:00 pm

**Sample Afternoon Workout Day**
**Eating Example**

- Breakfast – 7:00-8:30 am
- Mid-morning snack – 10:00am
- Lunch – 11:30am-1:00 pm
- Small pre-workout snack – 3:00-4:00pm
- Hydrate during workout
- Post-workout snack – within 30 minutes
- Dinner – 6:00-7:30 pm
- Evening snack – 9:00 pm

## 2-a-day Practice Eating Example

- 5:00am snack
  - Granola bar, energy bar, banana, baggie of cereal
- Workout
- Post-workout snack: chocolate milk
- Breakfast within 45 min-1 hour after practice
- Lunch 11:00am-12:00pm
- Afternoon (pre-workout) snack around 2pm-ish
- Workout: Consuming water & Gatorade
  - Might want to consume energy bar or granola bar in the middle of practice if possible
- Dinner within 45 min-1 hour after practice
- Evening snack approximately 3 hours after dinner

## Hydration in Young Athletes

- **Fluid Intake**
  - Young athletes have a greater ratio of surface area to body mass and absorb environmental heat more readily than adults
  - Consequently have a greater risk for experiencing heat stress when exercising in hot environments
  - Children have a lower sweating capacity reducing their ability to dissipate body heat by evaporation
  - As children grow, body surface grows, increasing their need for fluid and electrolytes
  - Research shows that when given water, young athletes do not replace fluid losses as completely as when provided a flavored sports drink

# Hydration in Young Athletes

- **Fluid Intake Continued**
  - Like adults, a 2% dehydration level will begin to compromise performance in young athletes
  - However with children, the negative side effects of fluid loss begin at 1% dehydration level
  - Fluid recommendations during exercise are vague for young athletes
    - Pre-exercise young athletes should be encouraged to drink water and/or sports drink consistently throughout the day
    - During exercise young athletes should consume electrolyte rich fluids
      - Giving water breaks is essential in young athlete practices and sports because they may not choose to do it on their own
    - Post-exercise athletes should monitor urine color to replace fluids lost during exercise

# Hydration Recommendations for Adolescent Athletes

- **<u>Pre-exercise</u>**
  - 2-3 hours prior exercise: 16-20 oz fluid
  - 10 minutes prior exercise: 5-10 oz fluid
- **<u>During-exercise</u>**
  - Really individualized to sweat rate
  - Every 15-20 minutes: 5-10 oz fluid
  - Water and sports drinks
    - Sports drinks especially after 1 hour of exercise and/or in very hot/humid conditions

- **<u>Post-exercise</u>**
  - 16-24 oz fluid for every pound lost
  - 24 oz if in 2-a-days or need to rehydrate quickly

## What counts as fluid for daily hydration?

- Water
- Flavored waters
- Sports drinks
- Tea
- Fruit juice
- Smoothies
- Jell-O
- Soup
- Fruits
- Vegetables

## Water versus Sports Drink

- **Water**
  - Great hydrator
  - Not a great rehydrator
  - Missing electrolytes
  - No carbohydrate
  - Not as palatable when luke-warm
  - Nothing in it that makes you want to drink it
- **Sports Drink**
  - Great hydrator
  - Great re-hydrator
  - Contains 6-8% solution carbohydrates to provide energy during long activity, but still empty gut fast enough
  - Provides electrolytes to replace what is being lost
  - Sodium content makes athletes want to drink it
  - Tastes better

## Hydration - Cramping

- **Typical causes:**
  - Fatigue
  - Dehydration due to loss of electrolytes
- **Foods to improve/prevent cramping**
  - High salt foods
    - Crackers, popcorn, bakes chips, pretzels
    - Tomato sauces, soups, pickles & pickle juice
    - Salt your food!
  - High potassium foods
    - Bananas, strawberries, cantaloupe, raisins
    - Avocados, potatoes, beans, broccoli, spinach
    - Yogurt, milk, tomato juice, soybeans
  - Sports Drinks
    - Gatorade, PowerAde, Hydrade, Accelerade

## Challenges to Proper Hydration

- Fatigue
  - Many athletes feel too tired to eat or drink after strenuous activity or if they are really hot
- Loss of appetite/thirst
  - Exercise kills appetite and thirst for many athletes
- Limited access to fluid
  - Are the coolers out of water?
  - Did the athlete already finish their bottle?
- Other post-exercise commitments
  - Team meetings, bus rides, showers and cleaning up, running to next practice
- Post-competition social activities
  - Going out to eat, talking to friends, taking pictures

# Combat Hydration Challenges

- Bring extra bottles of water/sports drink in a cooler in case you run out
- Bring the athlete's favorite drink
- Require "water breaks" during practice
- Have parents/volunteers/staff help distribute water on sidelines during games
- Post-practice or game, make all athletes stop and drink at least 8 oz of fluid
- Put water/sports drink stations in locker room/gym
- Monitor urine color
  - Goal: Pale yellow to clear

# Summary

- General nutrition recommendations
  - Young athletes should be eating small, frequent meals to keep their bodies fueled
  - A breakfast rich in complex carbohydrate and protein is essential to start a young athlete's day
    - If practicing in the morning, a "to-go breakfast" should be sent with athlete or they should eat in school cafeteria before class starts
  - Nutrient-rich snacks should be sent to school for in-between meals
  - Hydration of water, low-fat milk and other low-calorie fluids should be included at meals and snacks over the course of the day

# Summary

- Sports nutrition recommendations
  - Pre-workout snacks and sports drinks should be sent to school and practice so the athlete stays hydrated and fueled throughout practice and athletics class/PE
  - Half-time snacks and beverages should be provided during team sports practices, games and tournament play
  - A nutrient rich snack of carbohydrate, protein and fluid should be consumed within 45 minutes after exercise or game
  - Water and sports drinks should be provided before, during and after practice and games
    - Sports drinks are ideal when the activity is longer than an hour and in hot/humid environments

# References


- Dunford M and Coleman EJ. Sports Nutrition: A Practice Manual for Professionals, 5th ed.