Sports Nutrition
Sports Nutrition and Performance
Grades 9 – 12

I. Nutrition Education Objective:
   Goal 1: Students will comprehend concepts consistent with USDA guidance related to eating and physical activity for good health
   Objective: As a result of Pennsylvania’s SNAP-Ed plan, students will know, understand, analyze, and apply concepts, as developmentally appropriate, that are consistent with USDA guidance about the benefits of:
   1. Being physically active every day as part of a healthy lifestyle.
   2. Drinking plenty of water.

II. Pennsylvania Educational Standards:
   A. 10.1 Concepts of Health
   B. 10.2 Healthful Living
   C. 10.4 Physical Activity
   D. 11.3 Food Science and Nutrition

III. Outcomes:
   A. Students will identify healthy food choices to enhance sports performance based on MyPlate.
   B. Students will list principles of hydration for sports performance.
   C. Students will explain the importance of pre-meal timing and nutrient sources for sports performance.
   D. Students will state the appropriate use of sports supplements.

IV. Materials:
   A. Laptop/Projector with PowerPoint presentation
   B. Optional Handouts: “Get Your Motor Running”, “Eat to Compete”, “Hydration and Recovery”, “Sports Nutrition Fill-In-the-Blank Worksheet” (included in lesson plan)
   C. Other Optional Handouts: MyPlate handout, “Importance of Breakfast” (tear-off tablet)
   D. Food Tasting
   E. Reinforcement that conveys the appropriate nutrition message.
   F. Caregiver newsletter: Physical Activity
   G. Extension lessons for the teacher

V. Procedure:
   A. Introductory:
      1. Introduction of educator presenting the lesson
      2. Brief introduction about the workshop and its importance to high school students

   B. Developmental:
2. Slide 2: Project Sponsors
3. Slide 3: Today’s Topics
   a. *Introduce the topics for the day: MyPlate, adequate fueling, healthy food choices, hydration, supplements*
4. Slide 4: Why Does Nutrition Matter?
   a. *Ask students: Why does nutrition matter? Discuss student responses*
   b. Good nutrition is very important for peak athletic performance. Good nutrition is needed to properly fuel the body and to supply the nutrients needed to rebuild and repair the body.
5. Slide 5: MyPlate: Let’s Eat for the health of it!
   a. MyPlate is a tool designed to remind Americans to eat healthfully. It illustrates the five food groups using a familiar mealtime visual, a plate. MyPlate can help you visualize what foods and how much to eat at each meal.
   b. Some key tips are:
      i. Build a healthy plate
      ii. Eat the right amount of calories for you
      iii. Cut back on foods high in solid fats, added sugars and salt
      iv. Be physically active your way
   a. *Review the key messages from MyPlate:*
   b. Balancing Calories
      i. Enjoy your food, but eat less
      ii. Avoid oversized portions
   c. Foods to Increase
      i. Make half your plate fruits and vegetables.
      ii. Make at least half your grains whole grains
      iii. Switch to fat-free or low-fat (1%) milk.
   d. Foods to Reduce
      i. Compare sodium in foods
      ii. Drink water instead of sugary drinks
7. Slide 7: Physical Activity
   a. Teens need 60 minutes most days of the week.
   b. Athletes need to have high cardiovascular functioning
      i. This means your heart is working to the best of its ability, which happens through exercise
      ii. All athletes need a combination of aerobic and anaerobic activity. Aerobic activities include endurance activities that can be done for a longer amount of time such as running distances, jogging, swimming, playing basketball, soccer, volleyball, etc. Anaerobic activities include activities that require quick burst of energy such as sprinting or weight lifting.
8. Slide 8: How do we get energy?
   a. Energy comes from food and is measured in calories
b. There are three nutrients that give us calories; carbohydrates, protein, and fat

c. Three nutrients that do not give us calories are vitamins, minerals, and water. These are still very important for peak performance and all have their own jobs in the body.

9. Slide 9: Energy for the Athlete
a. The most important source of energy for the athlete is carbohydrates.
   i. Carbohydrates are vital for muscular energy and brain function.

b. Carbohydrates can be stored in our muscles as glycogen and used for quick energy. This is the energy that we use for performing in athletic events.

c. After exercise, we need to replace the used glycogen.

10. Slide 10: Carbohydrates
   a. Eat a diet rich in carbohydrates
      i. About 60% of an athlete’s diet should be in the form of carbohydrate.

b. Review amount of carbohydrate table

11. Slide 11: Carbohydrate Sources
   a. Foods high in carbohydrate include whole grains, fruits and vegetables, dairy and beans
      i. Emphasize the importance of choosing whole grains
      ii. Discuss that beans are high in carbohydrates and an important part of a healthy diet but probably not the best pre-workout choice because of fiber content
      iii. Review carbohydrate content of food table

12. Slide 12: Protein
   a. Protein is needed for muscle growth and repair of the body.
   b. Athletes usually get enough protein from a mixed diet.
   c. Protein from food is better for your body than protein supplements. The protein in foods is balanced with other nutrients which the supplements don’t usually have.
   d. Extra protein in the body will be stored as fat.
   e. An athlete’s diet should be about 10 – 20% protein.

13. Slide 13: Protein Sources
   a. Review sources of protein

14. Slide 14: Eat to Compete
   a. It takes food 1-4 hours to leave the stomach
      i. High carbohydrate foods leave the quickest and give your body quick energy
      ii. Foods high in fat stay in your stomach longer and can make you feel lethargic
      iii. Discuss lethargy and feelings of playing a sport on a full stomach
   b. Discuss nutritious, high-carbohydrate choices for pre-competition food.
      i. Yogurt, peanut butter and a banana, trail mix, etc.

15. Slide 15: When to Eat
   a. Eat a meal 3-4 hours prior to event.
b. A small snack about an hour before the event

c. A snack within 30 minutes of completing the event
   i. Waiting too long to eat will slow recovery
   ii. Eating something with good carbs and protein within 30 minutes of an event or vigorous workout can enhance glycogen replenishing and muscle repair.

d. A meal within 2 hours of finishing

   a. Pasta with a salad and a glass of milk
   b. Grilled chicken with rice and broccoli

17. Slide 17: What to Choose: Snacks
   a. Granola or breakfast bars
   b. Bagel with peanut butter
   c. Cheese and crackers
   d. Fresh fruit like apples, oranges, or bananas
   e. Carrots or celery
   f. Raisins, nuts, or trail mix
   g. Low-fat yogurt
      i. Discuss why each of these snacks are good choices

18. Slide 18: If you have to choose fast food for a quick bite on the way to a game…
   a. Choose low fat foods high in carbohydrates

19. Slide 19: Eating Breakfast (Handout Breakfast newsletter or mini-poster if needed)
   a. Breakfast is still the most important meal of the day
   b. Choose carbohydrates, protein, and healthy fats
   c. Cereal with banana
   d. Oatmeal
   e. Toast with peanut butter
   f. English muffin with egg and cheese
   g. A High Energy Breakfast = A High Energy Day!

20. Slide 20: Vitamins and Minerals
   a. Vitamins and Minerals do not provide energy but are important in a number of functions and peak performance
   b. Sodium and Potassium: Important for body fluid balance
   c. Antioxidants: Anti-inflammatory, can help prevent muscle soreness
   d. Calcium: Strong bones!
   e. Iron, Zinc, B12: Muscle function and recovery

21. Slide 21: Hydration
   a. The best way to stay hydrated is to drink before, during and after exercise
   b. Drink whether you are thirsty or not
      i. Explain that you lose fluids through breathing and perspiration so you lose even more when you are active
      ii. Your body can get dehydrated and overheat, so be especially careful in warm weather

22. Slide 22: How Much and When?
a. Review hydration table

   a. Water is the best form of hydration prior to an event
   b. If the event lasts longer than 1 hr, use sports drinks to replace electrolytes
   c. Mix ½ sports drink with ½ water if the sugar content upsets your stomach
   d. If sports drinks are unavailable, drink water and have a salty snack like pretzels

24. Slide 24: Review
   a. Review the topics that were discussed in the lesson
   b. Ask students to share what they learned

25. Slide 25: Questions

VI. Conclusion of lesson:
   A. Distribute hand wipes.
   B. Provide each student with a food tasting and encourage him or her to make small changes in his or her diet now. Explain why the food is a healthy option.
   C. Distribute the reinforcement, read the message and/or explain the reason why they are getting the reinforcement.
   D. Distribute caregiver newsletter.
   E. Thank the students for their participation and answer any questions the students have.

VII. Extension lessons:
High School Lesson: Sports Nutrition

Get Your Motor Running

What You Need To Know:
- Energy and Fuel comes from food and is measured in Calories
- Calories come from Carbohydrates, Protein, and Fat
- The Best fuel for our muscles is Carbohydrate!!
- High carbohydrate foods are grains, fruits, vegetables, dairy, and beans

You can store some extra carbohydrate as “glycogen” in your muscles.

**Training Diet** = Eating a high-carb diet of 450-550 grams/day to replace the glycogen you burn during training.

So what are some **high carbohydrate foods?**

<table>
<thead>
<tr>
<th>Grains</th>
<th>Vegetables</th>
<th>Fruits</th>
<th>Dairy</th>
<th>Meats</th>
</tr>
</thead>
<tbody>
<tr>
<td>food</td>
<td>grams</td>
<td>food</td>
<td>grams</td>
<td>food</td>
</tr>
<tr>
<td>Kaiser roll</td>
<td>30</td>
<td>Large baked potato</td>
<td>30-50</td>
<td>⅓ cup of dried fruit</td>
</tr>
<tr>
<td>⅓ cup of rice</td>
<td>28</td>
<td>1 ear of corn on the cob</td>
<td>19</td>
<td>Banana</td>
</tr>
<tr>
<td>1 oz cold cereal</td>
<td>20-24</td>
<td>⅓ cup mashed potatoes</td>
<td>18</td>
<td>⅓ cup of chocolate pudding</td>
</tr>
<tr>
<td>½ cup of pasta</td>
<td>20</td>
<td>½ cup of green peas</td>
<td>12</td>
<td>⅓ cup of applesauce</td>
</tr>
<tr>
<td>½ bagel</td>
<td>19</td>
<td>1 cup of collard greens</td>
<td>11</td>
<td>Apple</td>
</tr>
<tr>
<td>⅓ English muffin</td>
<td>14</td>
<td>1 cup of peppers</td>
<td>9</td>
<td>1 cup of grapes</td>
</tr>
<tr>
<td>1 slice of bread</td>
<td>13</td>
<td>½ cup of cooked carrots</td>
<td>8</td>
<td>Orange</td>
</tr>
</tbody>
</table>

USDA National Nutrient Database.

What can you eat tonight to raise your carbohydrate totals?
Pre-competition Meals – know what to eat and when to eat

- It takes 1-4 hours for food to leave your stomach
- Foods high in carbohydrate leave your stomach the fastest
- Foods high in fat can stay in your stomach much longer (>4 hrs)

➤ Best choice for pre-game meals is something high in Carbohydrate.
  - Carbs are easy to digest and become quick energy

How much should you eat before competition/exercise?

- Figure out how much time (hours) you have before you exercise and use the calorie amount that goes with it from the column on the right.
- Take that calorie amount and multiply it by your body weight in pounds.

<table>
<thead>
<tr>
<th>Time before exercise</th>
<th>Calories needed per pound of weight</th>
<th>Your weight (pounds)</th>
<th># of calories you need to eat before practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 hour</td>
<td>2</td>
<td>X _________ pounds</td>
<td>= __________ calories</td>
</tr>
<tr>
<td>2 hours</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 hours</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 hours</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>You have 3 hours</td>
<td>So...6 times</td>
<td>140 pounds</td>
<td>840 calories</td>
</tr>
</tbody>
</table>

Adapted from “Eating Before Competing” by N. Clark, RD and “Play Hard, Eat Right” by D. Jennings and S.N. Steen, RD

Healthy Snacks and Meals:

<table>
<thead>
<tr>
<th>200 calories</th>
<th>400 calories</th>
<th>600 calories</th>
<th>800 calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 ounces of Yogurt</td>
<td>1 ½ cups of cereal with 1 cup of skim milk and an apple</td>
<td>2 tablespoons of peanut butter and jelly on wheat bread and a piece of fruit</td>
<td>2 slices of turkey and cheese on a Kaiser roll with an orange and a cup of skim milk</td>
</tr>
<tr>
<td>1 English muffin with 1 tablespoon of jam</td>
<td>1 bagel and 1 cup of grapes</td>
<td>2 slices of ham and cheese on a Kaiser with an orange</td>
<td>2 cups of pasta with a cup of tomato sauce, 1 ½ cup of skim milk and a piece of fruit</td>
</tr>
</tbody>
</table>

USDA National Nutrient Database

Drexel University, HS Sports Nutrition Lesson Plan, Revised 7/14, page 7
Snacks – Snacks can be stored in your locker or gym bag for after school practices and games.

- Fresh fruit (apples, bananas, oranges, grapes)
- Baby carrots
- Celery, pepper, zucchini strips
- Granola and energy bars
- Crackers
- Fig bars
- Bags of dried fruit
- Peanuts
- Yogurt or pudding
- milk, water, 100% juice

Cafeteria – Be sure to choose healthy, high carbohydrate lunches from the cafeteria on game day and before practices.

On the Road – What’s the healthiest choice if you do have to eat at a fast food place on the way to a game or meet?

- Burger Joint – single burger or grilled chicken sandwich and a small order of fries or baked potato
- Convenience Store – turkey and cheese hoagie and a piece of fruit
- Pizza Place – 2 slices of thin pizza with a veggie topping or a side salad with breadsticks
- Mexican Place – bean burrito and low-fat chips and salsa
- What about drinks? – low fat

Other good ideas:

- Order low fat milk instead of soda
- Choose broiled or grilled foods over fried
- Order food without mayonnaise or “special sauces” (choose BBQ sauce, ketchup or mustard)
- Go easy on the egg, tuna and pasta salads because they are typically made with a lot of mayonnaise
- Ask for double veggies on sandwiches
- Order a salad with dressing “on the side”
Hydration & Recovery

Best way to stay well hydrated is to drink **Before, During, and After** exercise:

<table>
<thead>
<tr>
<th>Way Before</th>
<th>Right Before</th>
<th>During</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drink 2-3 cups of fluid 2 to 3 hours before playing</td>
<td>Drink 1 cup of fluid 10 to 20 minutes before playing</td>
<td>Drink 1 cup of fluid every 15 minutes</td>
<td>Drink at least 2 cups for every pound of lost weight</td>
</tr>
</tbody>
</table>

Remember! Drink regardless of whether you feel thirsty or not

The best drinks for recovering after a tough game or practice are milk and 100% juice because they contain important vitamins and minerals.

The % Daily Values are based on a 2,000 calorie diet. Modified from U.S. Department of Agriculture Nutrient Analysis

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**Milk Lowfat 1%**
- Calories 100
- Total Fat: 4g (% Daily Value: 4%)
- Total Carbohydrates: 11g (% Daily Value: 4%)
- Protein: 5g (% Daily Value: 5%)
- Vitamin A: 100%
- Vitamin C: 2%
- Vitamin D: 3%
- Calcium: 30%

Serving Size: 8 ounces

**Chocolate Milk Lowfat 1%**
- Calories 180
- Total Fat: 4g (% Daily Value: 4%)
- Total Carbohydrates (includes 4 tsp added sugar): 10g (% Daily Value: 10%)
- Protein: 8g (% Daily Value: 16%)
- Vitamin A: 100%
- Vitamin C: 2%
- Vitamin D: 25%
- Calcium: 30%

Serving Size: 8 ounces

**100% Orange Juice**
- Calories 110
- Total Fat: 0g (% Daily Value: 0%)
- Total Carbohydrates: 28g (% Daily Value: 8%)
- Vitamin A: 2%
- Vitamin C: 0%
- Calcium: 2%

Serving Size: 8 ounces

**Fruit Punch**
- Calories 130
- Total Fat: 0g (% Daily Value: 0%)
- Total Carbohydrates: 33g (% Daily Value: 11%)
- Vitamin A: 0%
- Vitamin C: 0%
- Vitamin D: 0%

Serving Size: 8 ounces

**Cola**
- Calories 150
- Total Fat: 0g (% Daily Value: 0%)
- Total Carbohydrates (includes 8 tsp added sugar): 14g (% Daily Value: 14%)
- Protein: 0g
- Vitamin A: 0%
- Vitamin C: 0%
- Vitamin D: 0%
- Calcium: 0%

Serving Size: 12 ounces

**Diet Cola**
- Calories 0
- Total Fat: 0g (% Daily Value: 0%)
- Total Carbohydrates: 0g
- Protein: 0g
- Vitamin A: 0%
- Vitamin C: 0%
- Vitamin D: 0%
- Calcium: 0%

Serving Size: 12 ounces

**Bottled Water**
- Calories 0
- Total Fat: 0g (% Daily Value: 0%)
- Total Carbohydrates: 0g
- Protein: 0g
- Vitamin A: 0%
- Vitamin C: 0%
- Vitamin D: 0%
- Calcium: 0%

Serving Size: 8 ounces

**Sports Drink**
- Calories 60
- Total Fat: 0g (% Daily Value: 0%)
- Total Carbohydrates: 15g (% Daily Value: 5%)
- Protein: 0g
- Vitamin A: 0%
- Vitamin C: 0%
- Vitamin D: 0%

Serving Size: 8 ounces

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Drexel University, HS Sports Nutrition Lesson Plan, Revised 7/14, page 9
Circle or fill in the best answer as the instructor goes through the slides. The instructor will go over the correct answers.

1. What three sources provide an athlete with energy?
   ______________________   _______________________     ______________________

2. Which food source is the most efficient fuel source for athletes?
   ______________________

3. Carbohydrates are stored in your _____________________.

4. Athletes should consume a high carbohydrate diet. Name 3 foods that are a good source of carbohydrates.
   ______________________   _______________________     ______________________

5. True or False: An athlete should be burning protein for energy.

6. True or False: A low carbohydrate meal is the best for a pre-game meal.

7. How soon after a game should a sports drink be consumed?
   ______________________

8. Within _______ hours a high carbohydrate/lean protein meal should be consumed.

9. Drink _______ cups 2-3 hours before playing

10. Drink _______ cup 10-20 minutes before playing

11. Drink _______ cup every ________ DURING the game

12. Drink _______ cups for every pound of body weight lost.
13. True or False: An athlete should wait until he or she is thirsty to start drinking water.

14. True or False: Water is sufficient for events under 45 minutes.

15. Which two nutrients do not provide energy but are important for peak performance?

____________________     ___________________

16. Name 2 vitamins and/or minerals that are important for peak performance.

____________________     ___________________