Menu Plan For High School Football Player

Tartan Sr. High in Oakdale MN

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1. Introduction

Diet and exercise are two very important aspects in the health and performance of high school football players. There are many contributing factors that can greatly affect what and how much football players in high school can eat such as age, gender, body size , weather, education level, and amount of time and skill level of the player. High school football players age can range from 14-18 years old males. This age range indicates that most high school football players are going through puberty and thus have higher nutrient needs that have to be able to support hormone changes and growth in the body, in addition to their daily energy expenditure.[1] The recommended dietary intake of calories for males ages 14-18 years old is 2000-3200 calories per day, with about 225-325 grams of carbohydrates, 56-78 grams of fat, and 50-150 grams of protein.[2] However, males ages 14 to 18 that play football should be getting between 3400-4500 calories, 600-800 grams of carbohydrates, 70-130 grams of fat, and 130-180 grams of protein per day.[1] Because high school football players are participating in more, higher intensity activities, they need even more nutrients than the average high school male going through puberty.

Body size is another contributing factor that greatly affects the nutritional needs of a high school football player. Caloric and nutrient needs generally increase with height, weight, and BMI because they require more energy to maintain their tissues.[3] As mentioned before, most high school football players are going through puberty and growing taller and heavier, thus have higher nutritional needs. High school football players specifically have more muscle mass than the average teenage boy, which means the amount of calories they burn is higher, therefore they must also consume more calories to meet their nutritional needs.[3]

Education level and economic status can also determine diet and knowledge of nutritional needs for high school football players. Because these football players are in high school, it is assumed that their knowledge of nutrition has mainly come from classes at school. Ninety-nine percent of public schools offer some sort of nutrition education to all students.[4] Over 90 percent of the nutrition education high school students receive cover topics such as relationship between diet and health, choosing healthy foods, MyPlate, and the Dietary Guidelines.[4] However, many schools don’t cover the extra nutritional needs of high school athletes. This means that high

school football players lack a lot of knowledge and skill pertaining to their own nutritional needs, making it difficult for them to make the proper meals that meet these needs.

The specific high school football team we are studying is based out of Tartan Sr. High in Oakdale, MN. The normal football season takes place in the Fall season from September to November, with the average temperature ranging from 38-46 degrees Fahrenheit in Minnesota.[5] However, in Minnesota, it can also get below freezing (32°F) during the Fall football season.[5] This is important because climate and temperature can affect how many calories the football players are burning and how much energy they need. The American Council on Exercise found that the body expends more calories in hot weather (68°F-86°F) than in cold weather (32°F-50°F).[6] This means that football players would require more calories during hotter temperatures than colder temperatures. In Minnesota, colder weather would not greatly affect the diet of a high school football player. However the American Council on exercise also found that if the weather is cold to the point of shivering, the body does need more energy (about 400 calories) to maintain body heat.[6] Since it can get below freezing during football season in Minnesota, on very cold days football players should consume about 400 more calories in order to maintain body temperature and not get fatigued.

Because high school football players have a busy schedule with practices/games and lack the skills to prepare their own meals, many of them depend on school lunches to help them meet their nutritional needs. School lunches have been designed to help students maintain a balanced diet[4], but they only take into account the nutritional needs of the average student and not those of a high school football player. The USDA requirements for a school lunch for grades 9-12 are 750-850 calories, 5 cups of fruit, 5 cups of vegetables, 10-12 cups of grains, and 10-12 ounces of meat.[7] This means that many high school football players are not getting their nutritional needs from their school lunches and thus depend largely on the meals they eat from home. However, the average high school football player attends at least two games per week and two hour practices every day after school with an extra practice on Saturday.[8] Trying to get a proper diet in with this hectic schedule is very difficult for high school football players and because of these time restraints, it is even more difficult for them to get their daily nutritional needs.

Considering all these factors, the eating habits of the Tartan Sr. High football team are mainly aimed at getting in their required calories, carbohydrates, protein, and hydration needs. They do

this by trying to eat a high calorie breakfast every morning, eating at least five times a day to replenished calories, eating every three hours to replenish calories, and drinking plenty of water. Following these basic guidelines will help Tartan Sr. High football players meet their daily nutritional requirements so that they can perform at top level, while remaining healthy.

2. 7-Day Meal Plan for High School Football Players

Breakfast is usually eaten at home and is prepared by either themselves or their parents. Occasionally breakfast is eaten at school and is provided by the school. Snacks during the school day are eaten during breaks in class and study hall hours. These are brought from home. Snacks on the weekends are eaten at home. Lunch is eaten at school and is provided by the school. On weekends lunch is prepare by the student or their parents and is eaten at home. Sometimes the football players will go out for lunch, on weekdays or weekends. Dinner is always eaten at home and is prepared by the parents. Water is also drunk throughout the entire day.

2.1 Day 1 (Monday)
Total Calories 4007

Breakfast (628 calories)
-Eaten at home before school
2 cups red berries cereal (62g) (220cal)
1 banana (118g) (105cal)
2 eggs, scrambled (94g) (199cal)
1 cup low-fat milk (244g) (102cal)

Snack (334 calories)
-Brought from home. Eaten between classes.
2 graham crackers (28g) (118cal)
2 scoops nutritional shake mix chocolate (38g) (135cal)
1 peach (98g) (38cal)
1 cup of water

Lunch (810 calories)
-Went out to lunch with friends
1 cups of vegetable juice (340g) (70cal)
Subway
5 oz sliced roast beef (143g) (275cal)
2 slices whole-wheat bread (75g) (231cal)
6 slices tomatoes (12g) (30cal)
6 slices cucumber (21g) (3cal)
3 leaf lettuce (30g) (6cal)
Salad
½ cup of potato (144g) (164cal)
½ cup of vegetable (207g) (33cal)

Snack (251cal)
-Brought from home. Eaten during study hall period.
1 cup lowfat yogurt (226g) (180cal)
1 serving blueberries (125g) (71cal)

1 cup of water

Pre-practice snack (607 calories)
-Brought from home. Eaten after school in hallway or locker room.
1 protein bar (50g) (190cal)
64 fl oz Gatorade (1899 g) (417cal)(also throughout practice)

Post-practice snack (582 calories)
-Brought from home. Eaten in locker room or in car on way home.
1 peanut butter an jelly sandwich (75g) (343cal)
1 orange (140g) (69cal)
1 cup grape juice (240g) (170cal)

Dinner (797 calories)
-Eaten at home. Prepared by parents.
1 cup of orange juice (248g) (118cal)
6 oz of grilled chicken (196g) (217cal)
1 baked potato (299g) (278cal)
1t. light butter (14g) (45cal)
¼ cup of broccoli (39g) (14cal)
¼ cup of carrot (30g) (13cal)
¼ cup of corn (39g) (31cal)
¼ cup of green beans (31g) (11cal)
1 wheat roll (28g) (76cal)

2.2 DAY 2 (Tuesday)
Total Calories 4050

Breakfast: (577 calories)
-Eaten at home at breakfast table. Prepared by parents.
Omlette:
3 eggs (282cal)
3 tablespoons of diced Tomatoes (10cal)
¼ cup Spinach (3 cal)
¼ cup cheddar Cheese (100 cal)
3 tbsp Red Onion (12 cal)
1 Teaspoon olive oil (40 cal)
1 slices of whole grain bread (70 cal)
.5 tbsp butter
1 cups of 100% orange juice (60 cal)

Snack: (235 calories)
-Brought from home. Eaten between classes.
1 cup Trail mix: a blend of raisins, nuts, cranberries, sunflower kernels, and pumpkin seeds- 130 calories (28g)

1 Banana (105 calories) (118g)
3 cups Water (throughout day)

Lunch: (714 calories)
-School lunch. Eaten in the cafeteria.
Sandwich:
2 slices of whole grain bread (140cal) (56g)
4 slices turkey (80 cal) (45g)
¼ cup shredded lettuce (2cal) (15g)
1 tomato (16cal) (91g) - for sandwich and salad
2 slices provolone cheese (140cal) (38g)
1 tablespoon mayo (90cal) (13g)
Salad:
1 cup Iceburg lettuce (7cal) (55g)
¼ cup raw onions (12cal) (28g)
¼ cup raw cucumber (4cal) (26g)
2 tbsp sunflower seeds (93cal) (16g)
1.5 tbsp Light Italian dressing (40cal) (23g)
1 cup skim milk (90cal) (250g)

Snack: (496 calories)
-Brought from home. Eaten during study hall period.
4 tbsp Peanut butter (380 cal) (64g)
1 Apple (116 cal) (223g)
3 cups Water (throughout day)

Pre practice snack: (695 calories)
-Brought from home. Eaten after school in locker room.
Power/protein bar (200cal) (78g)
64 fl oz Powerade blue (426cal) (1920g) (also throughout practice)
1 Orange (69cal)

Post practice snack (30 min after practice) (196 calories)
-Eaten at home before dinner.
6 ox nonfat vanilla yogurt (91cal) (170g)
1 cup strawberries (15cal)
¼ cup Granola (90cal) (27g)

Dinner: (1079 calories)
-Eaten at home at dinner table with family. Prepared by parents.
4oz whole grain pasta (420cal)
½ cup red meat sauce (109cal) (125g)
1 grilled chicken breast (282cal) (172g)
Olive oil
2 cups cooked green beans (88cal) (250g)
Butter

2 cups skim milk (180cal) (500g)

2.3 Day 3 (Wednesday)

Breakfast:
3 pancakes
4 Tbsp Maple syrup
1 banana
1.5 cups apple juice

Snack:
1 cup pretzels
3 Tbsp natural peanut butter
Water

Lunch:

1, 3x4 slice of lasagna

- Pasta noodles
- Ricotta cheese
- Mozzarella cheese
- Parmesan cheese
- Ground beef
- Marinara sauce

2 slices of whole grain bread
2 tbsp butter
1 tbsp garlic powder
1 cup steamed broccoli
1 cup raspberries
1 cup skim milk

Snack:
1 cup popcorn
1 cup mango
1 cup Water

Pre-practice snack:
2 cups of protein shake
¼ cup blueberries

Post-Practice snack:

16 oz Powerade
¼ cup sunflower seed kernels
1 apple

Dinner:
1 cheeseburger
- 1 slice Cheddar cheese
- 1 bun
- ½ cup lettuce
- ¼ cup diced tomatoes
- 1 tbsp Ketchup

1 baked potato
- 2 tsp. Butter
- Dash of Salt

2 cup steamed cauliflower
1 cup skim milk
1 medium chocolate chip cookie

2.4 Day 4 (Thursday)

Breakfast:
3 eggs over easy
2 slices whole grain toast
1 Tbsp butter
1 cup orange juice
½ cup raspberries

Snack:
1 cup strawberry yogurt
¼ cup granola

Lunch:
Chipotle burrito
- Large Tortilla
- Chicken
- Black beans
- Tomatoes (pico salsa)
- Cheese
- Lettuce
- Sour cream

½ cup Tortilla chips
3 Tbsp Guacamole
1 cup Lemonade

Snack:
½ cup crackers
3 Tbsp Hummus

Pre-practice snack:
16 oz Gatorade
1 protein bar

Post-Practice snack:
1 banana
1/2 cup raisins

Dinner:
1 serving of salmon
- Cooked in 2 tbsp Olive oil

1.5 cups quinoa
2 cups cooked asparagus
1.5 cups skim milk

After dinner snack:
2 Tbsp Nutella
½ cup pretzels

2.5 Day 5 (Friday)

Breakfast:
2 cups Oatmeal- with dash of cinnamon and brown sugar
1 apple
¼ cup strawberries
1 cup orange juice
1 slice of whole grain toast- with butter and cinnamon

Snack:
½ cup Almonds
½ cup Kale chips

Lunch:
1 Grilled chicken breast
1.5 cup Mashed potatoes
1.5 cup Green beans
1 cup skim milk

Snack:
¼ cup Dried fruit
¼ cup Celery

2 Tbsp peanut butter

Pre- Game snack:
1 Protein bar
1 banana
64oz Gatorade- throughout the game

Post- Game Snack:
2 Rice cakes
2 Tbsp peanut butter
1 banana
1-3 cups Water

Dinner:
3 medium slices Pizza

- Pizza sauce
- Shredded cheese
- Chicken
- Tomatoes

Salad

- 2 cups spinach
- ¼ cup diced Tomatoes
- 2 tbsp Onions
- ¼ cup chopped Cucumber
- ¼ cup Croutons
- 2 Tbsp French dressing

1 cup milk
12oz soda

2.6 Day 6 (Saturday)

Breakfast:
3 slices French toast
4 Tbsp maple syrup
1 cup strawberries
1 cup chocolate skim milk

Snack:
¼ cup Raw Carrots
¼ cup Raw broccoli
3 Tbsp Ranch dressing

Lunch:
Grilled Chicken wrap

- 1.5 cup Grilled chicken
- 1 large Whole wheat tortilla
- ¼ cup Tomatoes
- 2 tbsp Onions
- ½ cup Lettuce

½ cup sugar snap peas
½ cup pasta salad

Snack:
1 Whole grain bagel
2 Tbsp cream cheese
1 apple

Pre-lifting (practice) snack:
1 apple
3 Tbsp peanut butter
16 oz powerade

Post-lifting (practice) snack:
1 banana
1 granola bar
1-3 cupsWater

Dinner:
1 6oz Steak
1 Baked potato

- 1 tbsp Butter
- Dash Salt

1.5 cups cooked peas
1 cup skim milk

Dessert:
½ cup Ice cream

2.7 Day 7 (Sunday)

Breakfast:
3 eggs- scrambled
2 Slices of whole grain toast
1 Tbsp butter
1 Grapefruit
1 glass of Apple Juice

Snack:
2 beef meat sticks (0.56oz)
¼ cup cheddar cheese
5 whole grain crackers

Lunch:
1 grilled cheese
    2 slices whole grain bread
    2 slices of provolone cheese (2oz)
    2 slices cheddar cheese
    1 Tbsp butter
2 cups of tomato soup
1 cup steamed carrots
1.5 glasses of skim milk

Snack:
1.5 cup vanilla yogurt
¼ cup blackberries
¼ cup granola

Dinner:
1/2 cup grilled chicken
2 Tbsp teriyaki sauce
1 cup of brown rice
1 cup edamame
1 cup cooked green beans
1 cup skim milk

3. Observation

3.1 Observation Site 1

Date: 10/17/2014

Location of the meal: school

Time of meal: Pre-practice snack (2:30pm)

Observer: Kinsey Rohling

Meal Consumption Questions

These questions should be addressed during the observation to obtain as much information as possible to disseminate to your group as well as discuss your menu and the success in the Summary section of the paper.

1. Who is present at the meal (e.g. family, friends, alone, etc.)?

   The whole football team is present (varsity and jv), along with four football coaches and a few other students/friends.

2. Duration of meal

   a. Is the time allowed enough time to eat all components of the meal? (This should be actual time that is allowed when the food is available not including waiting time for food.)

      Most players consumed their pre-practice snack about an hour before practice, some even earlier. It took an average of 3 minutes for everyone to consume their snack.

   b. Is the person allowed to dismiss themselves from the table early?

      The players did not eat at a table. They all ate their snacks at various times at the school. Some ate in the cafeteria, most ate their snacks outside their lockers before going to the locker room for practice.

3. How is the food served? What type of dishes (reusable, disposable)? Are plate/bowl/eating and serving utensils standard types and sizes?

The food and drinks were all pre-packaged and brought from home by the players. There was powerade available from a vending machine at school a couple players used. All the players ate some form of protein/protein bar before practice that was pre-packaged and drank about 16oz of a sports drink.

4. Who served the food?

   The food was not served by anyone; it was brought from home by the players.

5. How the food was served (pre-portioned, self-serve, etc.)?

   The food was pre-packaged, so it was also pre-portioned. However some players did not consume their entire snack before practice.

6. Who determines portions (pre-portioned, self-serve, serving cups, etc)?

   The portions were pre-packaged and pre-portioned, but not all players consumed their entire snack, so the portions were also self-serve because the players decided how much they wanted to eat.

7. Menu – what foods are served?

   There was no actual menu, but the coaches encourage their players to eat a protein bar with a little bit of sports drink before practice. Most players consumed a protein bar with at least 20g of protein with either Gatorade/Powerade or water.

   a. How are items served, cooked or raw, baked or fried (add as much detail as possible)?

      The items were all pre-packaged and uncooked. The protein bars were in a wrapper and the drink was from a bottle or water fountain.

   b. Comment on the most, least popular items? **Were their items not taken or tossed excessively?**

      Since the players brought their own snack, they chose items they really liked, so very little was thrown away or not eaten.

      I asked the players their favorite flavors of protein bars and sports drink. All the players liked chocolate and/or peanut butter flavored protein bars, none of them liked fruit in their protein bars. The most popular sports drink flavor was blue/blueberry and the least favorite was purple/grape.

8. Are there any distractions present during the meal?

The whole team was talking to each other and friends while eating their snack. There were also other school activities getting started while they were eating. Some players did homework while eating their snack. Some players also snacked while their coaches went over plays and their practice plan for that day.

9. Other information of interest concerning the meal:

   All the players ate only one protein bar before practice.
   The players consumed between 8oz-16oz of sports drink or water before practice.
   Two players did not consume any liquid before practice.

3.2 Observation Site 2

Date: 10/21/14

Location of the meal: Tartan Sr. High

Time of meal: Lunch (12:16pm)

Observer: Kinsey Rohling

Meal Consumption Questions

These questions should be addressed during the observation to obtain as much information as possible to disseminate to your group as well as discuss your menu and the success in the Summary section of the paper.

1. Who is present at the meal (e.g. family, friends, alone, etc.)?
   Friends; the whole varsity football team eats together with other friends present also. There are also teachers and faculty present during lunch, but they are watching the student instead of eating with them.

2. Duration of meal

   a. Is the time allowed enough time to eat all components of the meal? (This should be actual time that is allowed when the food is available not including waiting time for food.)
      The school lunch period at Tartan is 27 minutes long; but by the time the whole team got their lunch and started eating, there was about 17-24 minutes left of the lunch period. The whole football team was done eating 12 minutes after they sat down with their food, so there was more than enough time for everyone to eat.

b. Is the person allowed to dismiss themselves from the table early?
Students are to stay in the lunchroom for the whole lunch period, until the bell rings for them to go back to class.

3. How is the food served? What type of dishes (reusable, disposable)? Are plate/bowl/eating and serving utensils standard types and sizes?

Above is a picture of what a lunch tray at Tartan looks like; they are disposable Styrofoam trays that come with a plastic spoon, fork, and knife. The food is served cafeteria style with three main lines to choose from; main line, ala carte, and salad bar. There is also a small snack line that offer foods such as cookies, brownies, candy, trail mix, granola bars, pop, etc. Most of the football player chose the ala carte line which was serving pizza or hamburger, French fries, peaches, green beans, and breadstick. Some also went to the main line, which was serving shrimp poppers with green beans, macaroni and cheese or mash potatoes, and peaches. None of the players went to the salad bar line. Almost of the players asked for/bought extra food.

4. Who served the food?
The food was served by cafeteria workers. The salad bar line allowed students to pick their own salad, sandwich, or soup along with a choice of fruit and serve themselves.

5. How the food was served (pre-portioned, self-serve, etc.)?
The food is pre-portioned, but the students are able to ask for extra (most football players asked for extra food).
The salad bar is self serve, but all the salads, sandwiches and soups are pre-made and pre-packaged. The fruit served at the salad bar is all raw.

6. Who determines portions (pre-portioned, self-serve, serving cups, etc)?
The school lunch program and faculty determine the minimum portions of the school lunches. They determine these portions according to the USDA's National School Lunch programs. However, students can also determine their own portions by asking for more or less food. According to the USDA the minimum servings of various foods are 1 cup of fruit, 1 cup of veggies, 2 oz of grains, 2 oz of meat, and 1 cup of milk.

7. Menu – what foods are served?

a. How are items served, cooked or raw, baked or fried (add as much detail as possible)?
In the ala carte line, the pizza was baked, the French fries were baked, the bread stick was baked, the green beans were boiled, the hamburger was grilled, and the peaches were canned with water.
In the main line the shrimp poopers were baked, the mac and cheese was boiled and cooked, the mash potatoes were cooked, the green beans were boiled, and the peaches were canned with water.
In the salad bar all the salad and sandwich items were raw, except for the grilled chicken on top of some of the salads. The soup was all cooked and served hot
In the snack line all food is pre-packaged and some items are baked such as the cookies and brownies.

b. Comment on the most, least popular items? **Were their items not taken or tossed excessively?**
The most popular meal was the pizza, French fries, green beans, and peaches; however most of the players threw away the green beans. The players that got the main line shrimp poppers meal also threw away a lot of green beans.
None of the players got any salad bar items, so these items were the least popular among the varsity football team.
Since the players had extra time after finishing their meal, many of them went to the snack line to buy more food. Popular items they bought were cookies, candy, and slushies.
Many of the players also bought two milks and drank both of them completely.
The most popular milk was 2%, then chocolate, then skim.

8. Are there any distractions present during the meal?
The players distracted each other by talking, but it did not stop them from eating. There was also a short announcement (about 3 minutes) in the middle of the lunch period about a fundraiser going on for the school.
The cafeteria was also very loud, but this didn't seem to distract any of the players or students.

9. Other information of interest concerning the meal:
Many of the players also got condiments with their meals such as ketchup, mustard, salt, pepper, tartar sauce, and ranch.
No football players brought lunch from home this day.

3.3 Observation Site 3

Date: 10/25/2014

Location of the meal: Taco John's

Time of meal: After football practice (6:30pm)

Observer: Kinsey Rohling

Meal Consumption Questions

These questions should be addressed during the observation to obtain as much information as possible to disseminate to your group as well as discuss your menu and the success in the Summary section of the paper.

1. Who is present at the meal (e.g. family, friends, alone, etc.)?
   Twelve of the varsity players and a few of their friends were present. There were other people in the restaurant, but they weren't eating with the group.

2. Duration of meal

   a. Is the time allowed enough time to eat all components of the meal? (This should be actual time that is allowed when the food is available not including waiting time for food.)
      The group was not a specific time schedule for this meal. The group was at the restaurant for about an hour, but everyone was finished eating after about 25 minutes.

   b. Is the person allowed to dismiss themselves from the table early?
      The group was allowed to dismiss themselves at whatever time they finished. Some of the guys left before the whole group was finished, which didn't seem to bother anyone else.

3. How is the food served? What type of dishes (reusable, disposable)? Are plate/bowl/eating and serving utensils standard types and sizes?
   Since the food was eaten in the restaurant, it was served on plastic trays. The tacos and burritos were individually wrapped in tinfoil-like paper, the potato oles (tater-tots) were served in disposable bowls, and all the condiments were in plastic packets or plastic containers. All the utensils were also disposable. The serving sizes are larger, but standard for fast food.

4. Who served the food?
   The food was made and served by Taco John's employees.

5. How the food was served (pre-portioned, self-serve, etc.)?
   The food was all pre-portioned by the Taco John employees according to Taco John's recipes.

6. Who determines portions (pre-portioned, self-serve, serving cups, etc)?
   The portions are determined by Taco John's corporation; they make standard recipes that all Taco John locations and are pre-portioned for customers.

7. Menu – what foods are served?

   a. How are items served, cooked or raw, baked or fried (add as much detail as possible)?
      All the meat is cooked on a flat-top grill or fried, the potato oles are deep fried, the vegetables and cheese on the tacos/burritos are raw, and the chirros and donut bits are also deep fried. They also have an option for nacho cheese, which is kept warm in a nacho cheese dispenser.

   b. Comment on the most, least popular items? **Were their items not taken or tossed excessively?**
      The most popular items ordered were tacos, burritos, potato oles, nacho cheese, and pop. One person ordered nachos. None of the group ordered quesadillas, taco salads, mexi rolls, desserts, or chicken wings. No one had water. No food was thrown away, it was all eaten.

8. Are there any distractions present during the meal?
   People coming in and out of the restaurant, ordering food, getting up to refill pop (these things didn't seem to distract the group that much). There was a lot of talking and noise also present in the restaurant; I think the talking amongst the group was the biggest distraction and slowed down eating.

9. Other information of interest concerning the meal.
   Most of the football players got nacho cheese to dip their potato oles in.
   All the football players got regular pop.
   Of the players that ordered tacos, the minimum amount of tacos ordered and eaten was five and the most was eight. Of those who got burritos, the minimum ordered was two and the most was three.
   All football players got a side of potato oles.
   Popular condiments used were sour cream, nacho cheese, and taco sauce.
   The restaurant was kind of messy, with dirty tables and floors.
   Nutritional info is on Taco John's website and calories are listed on the menu.

4. Nutrient Analysis

Day 1

UNIVERSITY OF MINNESOTA
NDSR
NUTRITION DATA SYSTEM FOR RESEARCH

NDSR 2014 Averaged Recommended Dietary Allowances/Adequate Intake Report

Project Abbreviation: Group45 (Complete Project) Comment:
Life Stage Group: Males, Age 14-18 y

Nutrient	Amount Reported	RDA	%RDA	AI
Vitamin A	1803 mcg RAE	900 mcg RAE	200 %	
Vitamin C	467.546 mg	75 mg	623 %	
Vitamin D	6.404 mcg	15 mcg	43 %	
Vitamin E	20.339 mg	15 mg	136 %	
Vitamin K	247.646 mcg			75 mcg
Thiamin	3.548 mg	1.2 mg	296 %	
Riboflavin	4.499 mg	1.3 mg	346 %	
Niacin	92.459 mg NE	16 mg NE	578 %	
Vitamin B6	6.193 mg	1.3 mg	476 %	
Folate	1197 mcg DFE	400 mcg DFE	299 %	
Vitamin B12	12.089 mcg	2.4 mcg	504 %	
Pantothenic Acid	13.368 mg			5 mg
Choline	881.940 mg			550 mg
Calcium	1644 mg	1300 mg	126 %	
Copper	3458 mcg	890 mcg	389 %	
Iron	38.920 mg	11 mg	354 %	
Magnesium	635 mg	410 mg	155 %	
Manganese	7.833 mg			2.2 mg
Phosphorus	2598 mg	1250 mg	208 %	
Selenium	177.890 mcg	55 mcg	323 %	
Zinc	22.140 mg	11 mg	201 %	
Potassium	7 g			4.7 g
Sodium	6 g			1.5 g
Total Fiber	48.908 g			38 g
Total Water	4.876 l			3.3 l

RDA/AI values based on the Dietary Reference Intakes provided by the National Academy of Sciences, Institute of Medicine, Food and Nutrition Board (1997-2011).

NDSR 2014 Averaged Recommended Dietary Allowances/Adequate Intake Report

Project Abbreviation: Group45 (Complete Project) Comment:
Life Stage Group: Males, Age 14-18 y

Additional Recommendations

Nutrient	Amount Reported	% of Energy	Recommended Intake
Energy	4100 kcal		
Fat	109.249 g	23.643 %	25-35% [2]
Carbohydrate	617.779 g	58.591 %	45-65% [2]
Protein	182.546 g	17.628 %	10-30% [2]
Alcohol	0.000 g	0.000 %	
Cholesterol	621 mg		< 300 mg [1]
Saturated Fatty Acids	38.207 g	8.306 %	< 10% [1]
Trans-Fatty Acids	4.132 g	0.907 %	
Linoleic Acid	12.898 g	2.831 %	5-10% [2]
Alpha-Linolenic Acid	1.806 g	0.396 %	0.6-1.2%
Added Sugars	177.836 g	17.350 %	< 25% [2]

Note: DSAM nutrients are not included in these totals. Nutrient totals may not equal the sum of their parts. (Refer to the NDSR User Manual.)

Day 2

University of Minnesota
NDSR
Nutrition Data System for Research

NDSR 2014 Averaged Recommended Dietary Allowances/Adequate Intake Report

Project Abbreviation: Group45 (Incomplete Project) Comment:
Life Stage Group: Males, Age 14-18 y

Nutrient	Amount Reported	RDA	%RDA	AI
Vitamin A	1343 mcg RAE	900 mcg RAE	149 %	
Vitamin C	330.961 mg	75 mg	441 %	
Vitamin D	22.410 mcg	15 mcg	149 %	
Vitamin E	31.349 mg	15 mg	209 %	
Vitamin K	156.424 mcg			75 mcg
Thiamin	2.998 mg	1.2 mg	250 %	
Riboflavin	5.073 mg	1.3 mg	390 %	
Niacin	97.361 mg NE	16 mg NE	609 %	
Vitamin B6	4.576 mg	1.3 mg	352 %	
Folate	724 mcg DFE	400 mcg DFE	181 %	
Vitamin B12	10.321 mcg	2.4 mcg	430 %	
Pantothenic Acid	15.823 mg			5 mg
Choline	1184.933 mg			550 mg
Calcium	3300 mg	1300 mg	254 %	
Copper	4537 mcg	890 mcg	510 %	
Iron	32.441 mg	11 mg	295 %	
Magnesium	974 mg	410 mg	238 %	
Manganese	9.398 mg			2.2 mg
Phosphorus	4135 mg	1250 mg	331 %	
Selenium	249.836 mcg	55 mcg	454 %	
Zinc	38.888 mg	11 mg	354 %	
Potassium	9 g			4.7 g
Sodium	7 g			1.5 g
Total Fiber	68.051 g			38 g
Total Water	6.268 l			3.3 l

RDA/AI values based on the Dietary Reference Intakes provided by the National Academy of Sciences, Institute of Medicine, Food and Nutrition Board (1997-2011).

NDSR 2014 Averaged Recommended Dietary Allowances/Adequate Intake Report

Project Abbreviation: Group45 (Incomplete Project) Comment:

Life Stage Group: Males, Age 14-18 y

Additional Recommendations

Nutrient	Amount Reported	% of Energy	Recommended Intake
Energy	5388 kcal		
Fat	220.421 g	35.552 %	25-35% [2]
Carbohydrate	657.425 g	46.551 %	45-65% [2]
Protein	240.373 g	17.795 %	10-30% [2]
Alcohol	0.258 g	0.033 %	
Cholesterol	915 mg		< 300 mg [1]
Saturated Fatty Acids	69.323 g	11.251 %	< 10% [1]
Trans-Fatty Acids	3.349 g	0.559 %	
Linoleic Acid	40.288 g	6.730 %	5-10% [2]
Alpha-Linolenic Acid	2.497 g	0.417 %	0.6-1.2%
Added Sugars	197.460 g	14.659 %	< 25% [2]

Note: DSAM nutrients are not included in these totals. Nutrient totals may not equal the sum of their parts. (Refer to the NDSR User Manual.)

5. Menu Costing for One Day

USDA Food Cost Plan July 2014
Budgeted amount for one week: $56.00
Budgeted amount for one day: $56.00/7 = $8.00

Food Item	Brand Name	Purchase Size	Purchase Price	Serving Size	Cost per serving
eggs	Hickman's	18 count	$2.89	1 egg	$0.16
tomatoes	Nature Sweet	10.5 oz	$5.99	1 oz	$0.57
spinach	Olivia Organic Baby Spinach	16 oz	$11.99	1 oz	$0.75
Cheddar cheese	Sargento	16oz	$7.45	1 oz	$0.40
Red onion	Fresh	0.5lbs	$0.99	1 oz	$0.12
Olive oil	Botticelli	34oz	$9.59	1 oz	$0.28
Whole grain bread	Nature's Harvest	20 oz	$2.55	1 oz (slice)	$0.13
butter	Land O'Lakes	15 oz	$6.29	1 oz	$0.42
Orange juice	V8	64 fl oz	$4.89	1 fl oz	$0.08
Peanut butter	Skippy	64 oz	$12.45	1 oz	$0.19
Apple	Gala Apple	3lbs	$6.75	1lb	$2.25
water	Tap water	Free	free	free	free
Turkey	Hormel	15 oz	$8.99	1 oz (slice)	$0.60
Lettuce	Dole	11 oz	$3.75	1 oz	$0.34
Provolone cheese	Borden's	8 oz	$3.75	1 oz	$0.47
mayo	Hellman's	48 oz	$8.95	1 oz	$0.19

Cucumber	**MammaMia**	**16 oz**	**$5.25**	**1 oz**	**$0.33**
Sunflower seeds	**Planters**	**7 oz**	**$1.55**	**1 oz**	**$0.22**
Light Italian dressing	**Wish-bone**	**24 fl oz**	**$5.39**	**1 fl oz**	**$0.22**
Trail Mix	**Planters**	**19oz**	**$8.95**	**1 oz**	**$0.47**
banana	**Chiquita**	**2.4lbs**	**$1.65**	**0.5lb (1 banana)**	**$0.35**
Protein bar	**MET-Rx**	**3 oz (1 bar)**	**$2.25**	**1 bar**	**$2.25**
Powerade	**POWERADE**	**32 oz**	**$1.29**	**1 oz**	**$0.04**
orange	**Navel**	**1lbs**	**$1.89**	**1lbs**	**$1.89**
Non-fat vanilla yogurt	**Dannon**	**24 oz**	**$4.19**	**6 oz**	**$0.17**
Strawberries	**Driscoll's**	**16 oz**	**$5.99**	**1 oz**	**$0.37**
Granola	**Sunbelt**	**16 oz**	**$3.45**	**1 oz**	**$0.22**
Whole grain pasta	**Barilla**	**13.25 oz**	**$2.05**	**1 oz**	**$0.15**
Red meat sauce	**Ragu**	**66 oz**	**$6.75**	**1 oz**	**$0.10**
Chicken breast	**Perdue**	**32oz (2lbs)**	**$10.49**	**1 oz**	**$0.33**
Green beans	**Greenline**	**16 oz**	**$5.49**	**1 oz**	**$0.34**
Skim Milk	**Kemps**	**1 gallon**	**$2.90**	**1 cup**	**$0.18**

TOTAL FOR ONE DAY___$24.25___

Breakfast:
Omlette:
3 eggs - $0.48
Diced Tomatoes (3g) - $0.06
Spinach (7.9g) - $0.21
1oz cheddar Cheese - $0.40
Red Onion (2g) - $0.01
olive oil (13g) - $0.13
1 oz of whole grain bread - $0.13
Butter (14g) - $0.21
8fl oz 100% orange juice - $0.36
Snack:
4 tbsp Peanut butter (64g) -$0.43
1 Apple (1lb) - $2.25
3 cups tap Water FREE
Lunch:
Sandwich:
2 slices of whole grain bread - $0.26
4 slices turkey (45g) - $0.96
¼ cup shredded lettuce (15g) - $0.18
1 tomato (91g) - $1.80
1.3oz provolone cheese (38g) - $0.61
1 tablespoon mayo (13g) - $0.09
Salad:
1 cup Iceburg lettuce (55g) - $0.65
¼ cup raw onions (28g) - $0.12
¼ cup raw cucumber (26g) - $0.28
2 tbsp sunflower seeds (16g) - $0.12
1.5 tbsp Light Italian dressing (23g) - $0.18
1 cup skim milk - $0.18

Snack: 235 calories
Trail mix: a blend of raisins, nuts, cranberries, sunflower kernels, and pumpkin seeds (28g) - $0.47
1 Banana - $0.35
3 cups Tap Water FREE

Pre practice snack: 695 calories
Power/protein bar (3 oz) $2.25
64 fl oz Powerade blue - $0.08
1 Orange - $1.89
Post practice snack
6 oz nonfat vanilla yogurt (170g)- $0.17
1 cup strawberries (152) - $1.99
¼ cup Granola (27g) - $0.21
Dinner:
4oz whole grain pasta - $0.60
½ cup red meat sauce (125g) - $0.44
1 grilled chicken breast (172g) - $2.01
Olive oil - $0.13
2 cups cooked green beans (250g) -$2.99
Butter - $0.21
2 cups skim milk (500g) - $0.36

6. Discussion and Summary

High school football players are both teenagers and athletes, which makes them a special population desired to be observed. For high school football players going through puberty and exercising rigorously every day, a healthy, balanced diet is vital to support the growth phase of their young bodies. They should be supplied with enough calories for their daily activity and for building lean muscle mass as well as enough nutrients to support the growth and development of their young bodies. There are many contributing factors affecting the energy requirements of high school football players. The factors that contribute the most are age, body size and exercise; the weather, educational level and amount of time and skill level of the player are other factors that may also contribute.

High school football players are "energy machines". The recommended dietary intake of calories for males ages 14-18 years old is 2000-3200 calories per day, with about 225-325 grams of carbohydrates, 56-78 grams of fat, and 50-150 grams of protein.[2] However, males ages 14 to 18 that play football should be getting between 3400-4500 calories, 600-800 grams of carbohydrates, 70-130 grams of fat, and 130-180 grams of protein per day.[1] To cover the high expenditure of these young players, we set up around a 4000 calories daily menu plan divided into 7-8 meals.[9] On Sunday the players consume less calories because it is their day off from practice and games. The basic aim of our menu plan is to provide adequate calories, moderate amount of protein, high nutrient-dense complex carbohydrates, low saturated fat, with enough water and additional nutrients to support the growth and energy expenditure of high school football players.

Since carbohydrate supplies the muscles and brain with the fuels needed to meet the stress of training/competition and is quickest, most efficient energy source, we included it in all of our meals. The most prominent characteristic of our menu is that there are many high carbohydrate foods such as potatoes, cereal, beans, milk, and juice from day to night. Foods rich in protein are also important for building and repairing muscles. Knowing this we provided chicken, turkey, salmon, beef and such food with high quality protein every day for lunch and dinner. Considering fatty foods can slow digestion, we limited fats in our menu. We also paid much attention to the food variety to ensure an adequate intake of various vitamins and minerals. Lastly, hydration is also very important for optimal performance. In our menu milk, juice, sports drink and water are served all day to ensure proper hydration.

Besides the usual breakfast, lunch and dinner, we also included four snacks into the daily menu. Proper pre-game meals/snacks are especially important for a young athlete that is participating in an activity that will last longer than an hour. A good pre-game meal/snack can help provide energy to working muscles.[10] It can also help prevent fatigue, which could potentially hurt athletic performance.[11] High school football players should try to eat one to four hours prior to training or competition to leave enough time for the stomach to empty. Consequently if a player eats too closely to exercising, the body will be focused on digesting food and will not perform at its

optimum level.[10] Carbohydrate-dense foods provide the quickest and most efficient energy source and are easily digested, so it is suggested they are consumed before a practice or game. High-fat and high-fiber foods should be avoided before practice because fat can slow the emptying of the stomach and fiber takes too long to digest.

During the first four to five hours after exercise, the body is more efficient in absorbing and storing energy. After hard workouts that have lasted several hours, it is important to take in a carbohydrate-rich food or beverage within the first 30 minutes to replenish muscle glycogen stores.[12] To do this, players should rehydrate and eat foods rich in complex carbohydrates. For example, players should consume a snack that is more nutrient dense such as a large banana, yogurt, or cup of orange juice. About two hours after strenuous exercise, a player should have a nutritious, carbohydrate-rich meal. This will help replenish his muscle glycogen stores and prepare him or her for their next training session.

Based on our observations the foods that were most consumed by high school football players were protein/meat and carbohydrates, while the food least consumed were vegetables. These observations would indicate that the most popular and consumed foods of our menu plan would be foods such as eggs, chicken, turkey, pasta, pizza, hamburger, potatoes, burrito, and rice because they are high in protein and/or carbohydrates. The least consumed items on our menu plan would be lettuce, tomatoes, spinach, broccoli, carrots, green beans, and cucumbers because they are all vegetables. Because vegetables contain important nutrients needed by high school athletes such as vitamin B6 and folate[13], we incorporated meals in our menu plan that combine more the popular foods with the less popular vegetables. For example, we want the players to eat a Subway sandwich for lunch one day that contains roast beef and whole-wheat bread (popular items) along with tomatoes, cucumbers, and lettuce (less popular items).

According to the nutrient analysis, many of the nutrients were over 100% of the RDA. However, our population of high school football players nutrient needs exceed that of a normal male between the ages 14-18 years old because they are expending more energy in addition to their growth.[14] Some of the most important nutrients needed by high school football players can be found in table 1.[15] Because of the additional requirements of our population, we would not adjust our menu plan to lower the amount of nutrients consumed. Our menu plan also provides the adequate amounts of the major nutrients: fat, carbohydrate, and protein. Based on the nutrient analysis, our menu plan provides a balanced diet and hydration that will give the best conditions to allow the football player to achieve their full height and weight potential.

The Official USDA Food Plan states that a weekly low-cost plan for males ages 14-18 years old would be about $56.00, which would be about $8.00 per day. For our menu plan the cost of one day's meals would be about $24.25, which is about three times more than USDA Food Plan. Since high school football players need more energy and nutrients than the average high school boy, they will need to spend more money to buy more food. The USDA Food Plan also calculates cost

based on the preparation of meals and snacks at home, while our menu plans for the players to eat out at restaurants. For these reasons our menu plan did not stay in budget.

Overall, our menu plan meets the energy, nutrient, and hydration needs for high school football players to grow and perform at their optimum level. In our menu plan we made sure to include sufficient amounts of carbohydrates, protein, and water to support the additional needs of a high school football player. When planning the menu, we considered the appeal of the foods to our population and the skill level of our population. To make less desirable foods more desirable, we paired them with more popular foods that our population ate based on our observations. Because of the age group of our population (14-18 years old), we assumed their skill level to prepare and make proper meals to be low. However, we also assumed that the majority of our population lived with at least one parent/guardian that could more adequately prepare meals for them and also ate at least one meal while at school. With these additional resources, our population should be able to eat and/or prepare all the meals on the menu. With this information we created a variety of meals that could be prepared by the football player, their parent, and/or their school. With this knowledge we created a feasible menu plan that meets a high school football players' health and nutrition needs, appeals best to their palate, and is available through their skills and resources

7. Appendix

Table 1.

Vitamin B1 (Thiamine)	Thiamine helps break down carbohydrates and proteins for energy.
Vitamin B2 (Riboflavin)	Riboflavin is integral to energy production. It also plays a role in red blood cell formation.
Niacin	Niacin supports both anaerobic and aerobic performance.
Vitamin B6	Vitamin B6 is involved in over 100 metabolic reactions in your body, including the production of energy and hemoglobin, a protein in red blood cells.
Vitamin B12	Because of its role in red blood cell formation, B12 is crucial for getting oxygen to tissues.
Folate	Folate is important for cell production, heart health and protection against birth defects.
Vitamin C	Perhaps the most famous antioxidant, vitamin C offers a wide variety of health benefits, including protecting from infection and damage to body cells, helping produce collagen (the connective tissue that holds bones and muscles together), protecting your body from bruising by keeping capillary walls and blood vessels firm, and helping in the absorption of iron and folate.
Pantothenic Acid	This vitamin is needed for the breakdown of fats, proteins and carbohydrates into usable energy.
Biotin	Biotin plays an important role in energy production.
Vitamin D	Your body can make its own vitamin D with enough sun exposure.
Water (the most important)	Source of our lives

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