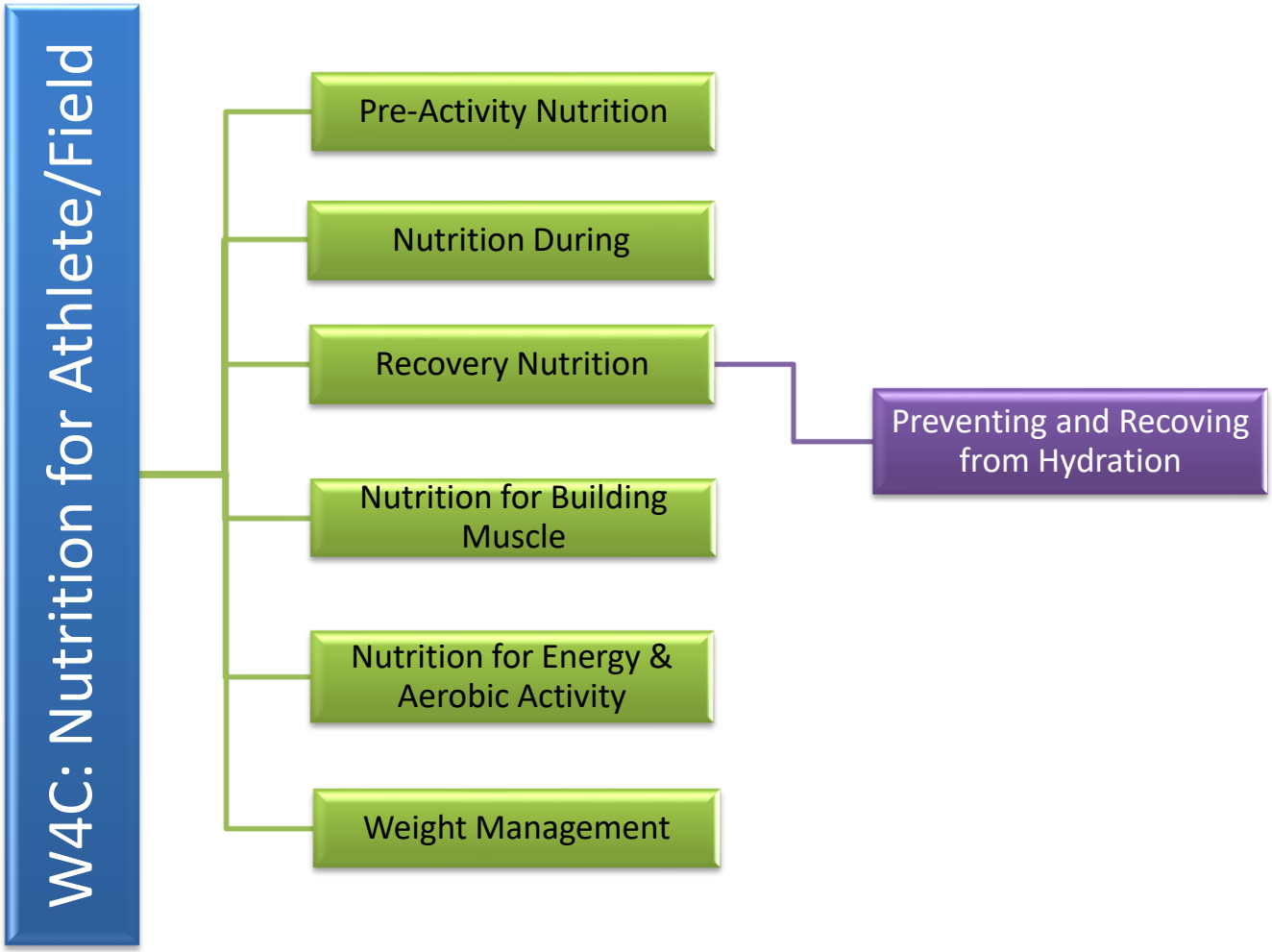
California Cadet Corps
Curriculum on Health and Wellness



Updated: 10 DEC 2020

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NUTRITION FOR ATHLETES / FIELD

C1. Pre-Activity Nutrition

C2. Nutrition during Activity

C3. Recovery Nutrition

C4. Nutrition for Building Muscle

C5. Nutrition for Energy & Aerobic Activity

C6. Preventing & Recovery from Dehydration

C7. Weight Management

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NUTRITION FOR ATHLETE/FIELD: UNIT OBJECTIVES

The desired outcome of this unit is for students to learn various nutritional facts, proper diets of nutrition, and planning for specific activities in a student cadet's life.

Plan of Action:

1. Describe appropriate pre-exercise nutrition for short and longer exercise periods
2. Give examples of appropriate foods to eat prior to exercise, and when
3. Describe the benefits of Supplements to an exercise program
4. Describe when and how much water you should consume pre-exercise
5. List negative effects an exercise from nutritional choices
6. Plan time and amount of intake of carbohydrates, proteins fats and sugars before, during, and after workouts
7. Define and explain BRAT
8. Define recovery phase, post-workout and post-workout nutritional window
9. Describe the nutrients needed for building muscle and the ranges for appropriate intake

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NUTRITION FOR ATHLETE/FIELD: UNIT OBJECTIVES

10. Execute calculations for energy needed for aerobic activity for an individual's weight
11. Explain the two required sources for energy
12. Define and explain hypohydration, hyper hydration, and rehydration
13. Explain the three levels of proactive weight management
14. Define obesogenic
15. Describe how weight management is an epidemic nationwide
16. Define the difference between vigorous and moderate activities/exercise.

PRE-ACTIVITY NUTRITION

OBJECTIVES:

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DESIRED OUTCOME (Leadership)

Cadets will embrace a healthy diet and apply nutritional facts, practices, and recommendations to their activity and exercise regimens.

Plan of Action:

1. Describe appropriate pre-exercise nutrition for short and longer exercise periods
2. Give examples of appropriate foods to eat prior to exercise, and when
3. Describe the benefits of Supplements to an exercise program
4. Describe when and how much water you should consume pre-exercise

Essential Question:

How do we prepare nutritionally before exercise, workout or fieldwork?

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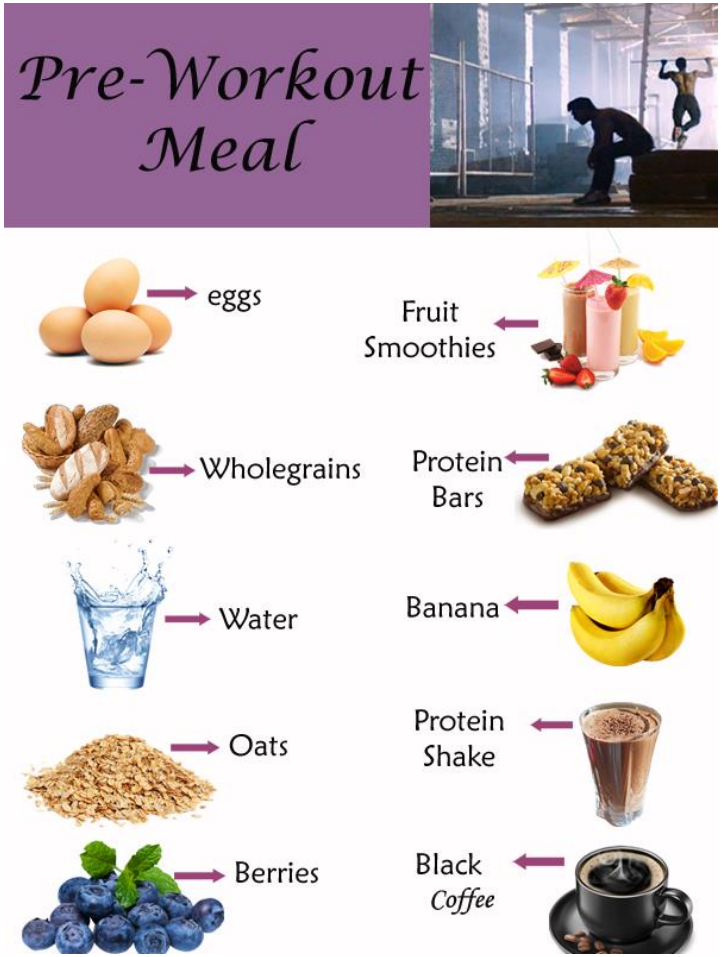
Pre-activity nutrition

- Nutrition can improve your athletic performance and help you achieve your goals
- Your body needs energy during workouts – you should provide it prior to going into a workout
- Your muscles use the glucose from carbs for fuel
- Pre-workout protein can improve athletic performance
- Fat is the source of fuel for longer and moderate-to-low-intensity exercise



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Carbs

- Your muscles use the glucose from carbs for fuel.
- Glycogen is the way the body processes and stores glucose, mainly in the liver and muscles.
- For short- and high-intensity exercise, your glycogen stores are your muscles' main source of energy
- But for longer exercises, the degree to which carbs are used depends on several factors. These include the intensity, type of training and your overall diet.
- Your muscles' glycogen stores are limited. As these stores become depleted, your output and intensity diminish.
- Studies have consistently shown that carbs can increase glycogen stores and utilization while boosting carb oxidation during exercise.
- Carb loading, which involves consuming a high-carb diet for 1–7 days, is a well-known method to maximize glycogen stores.

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Protein

- Many studies have documented the potential of pre-workout protein consumption to improve athletic performance.
- Eating protein (alone or with carbs) prior to exercise has been shown to increase muscle protein synthesis
- One study showed a positive anabolic response after participants consumed 20 grams of whey protein before exercise.
- Other benefits of eating protein before exercise include:
  - A better anabolic response, or muscle growth
  - Improved muscle recovery
  - Increased strength and lean body mass
  - Increased muscle performance

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Fats

- While glycogen is used for short- and high-intensity bouts of exercise, fat is the source of fuel for longer and moderate-to-low-intensity exercise.
- Some studies have investigated the effects of fat intake on athletic performance. However, these studies looked at high-fat diets over a long period, rather than prior to exercise.

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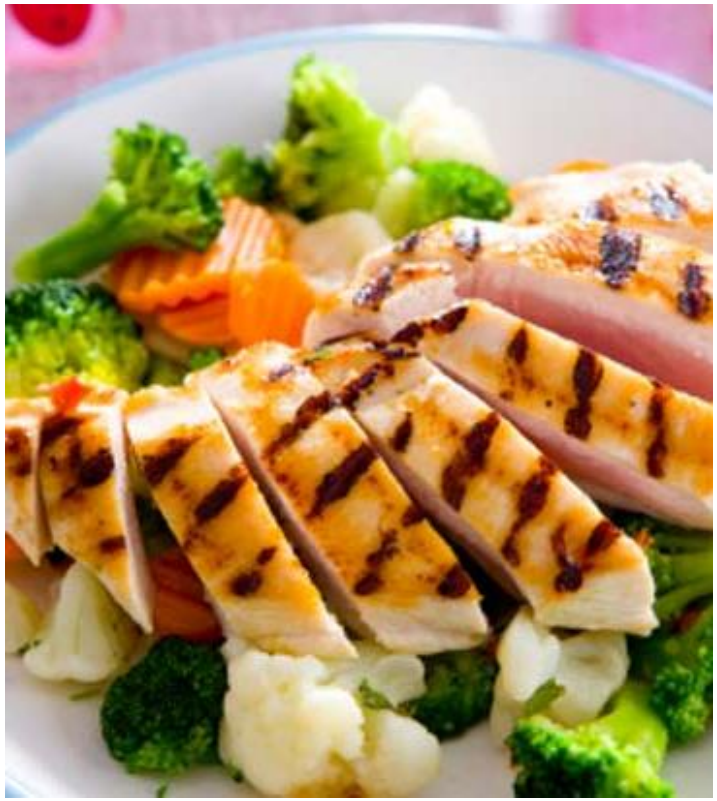
When Should You Eat?



- Try to eat a complete meal containing carbs, protein and fat **2-3 hours before you exercise**
- If you can't:
  - Eat a smaller, decent, pre-workout meal closer to your exercise time
  - The closer you are to exercising, the smaller and simpler your meal should be
- **45-60 min prior to workout**, choose foods that are simple to digest and contain mainly carbs and some protein. This should help prevent stomach discomfort during exercise

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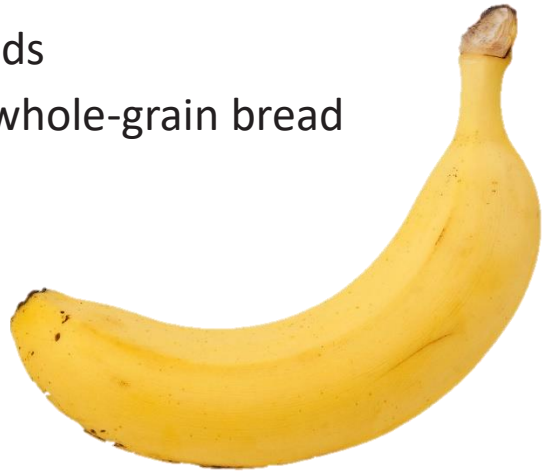
Sample Meals

- 2-3 Hours Before Workout:
  - Sandwich on whole-grain bread, lean protein and a side salad
  - Egg omelet and whole-grain toast topped with avocado spread and a cup of fruit
  - Lean protein, brown rice and roasted vegetables
- Workout within 2 Hours:
  - Protein smoothie made with milk, protein powder, banana and mixed berries
  - Whole-grain cereal and milk
  - A cup of oatmeal topped with banana and sliced almonds
  - Natural almond butter and fruit preserve sandwich on whole-grain bread
- Workout within an Hour:
  - Greek yogurt and fruit
  - Nutrition bar with protein and wholesome ingredients
  - A piece of fruit, such as a banana, orange or apple



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Supplements

- Supplements are common and can be useful to enhance performance, increase lean body mass, and reduce fatigue. Some of the best pre-workout supplements are:
  - Creatine
  - Caffeine
  - Beta-Alanine
  - Multi-Ingredient Supplement

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Pre-Activity Hydration

- Consume both water and sodium before exercise
- Improves your fluid balance
- 16-20 ounces (.5-.6 liters) of water at least four hours before exercise and
- 8-12 ounces (23-.35 liters) of water 10-15 min before exercise
- Consume a beverage that contains sodium

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CHECK ON UNDERSTANDING

1. Between carbs, proteins, and fat, which is most important for pre-exercise nutrition?
2. How long before exercise should you consume a balance meal?
3. How long before a meal should you consume water, and how much?

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NUTRITION DURING ACTIVITY

OBJECTIVES:

DESIRED OUTCOME (Leadership)

Cadets will embrace a healthy diet and apply nutritional facts, practices, and recommendations to their activity and exercise regimens.

Plan of Action:

5. List negative effects an exercise from nutritional choices
6. Plan time and amount of intake of carbohydrates, proteins fats and sugars before, during, and after workouts
7. Define and explain BRAT

Essential Question:

How do we intake nutritionally during exercise, workout or field?

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Nutrition During Activity

- Neglecting to intake nutrients during exercise can result in **hypoglycemia** (drop in blood glucose levels), muscle fatigue and overall loss of energy
- Biggest focus during exercise is **fluid intake**.
- **Carbs in moderation** during long workouts
- A caution given is that fructose, glucose and sucrose (**sugars**) should not be ingested at high rates during the activity phase because it can cause gastrointestinal (GI) issues.

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BRAT

- You'll likely only intake food during long exercise periods. What you eat is important
- Evidence is inconclusive on intake of proteins during the activity phase
- Limit your intake to low GI impacting carbohydrates:
  - **BRAT Diet**: Bananas, Rice, Applesauce, and Toast
- This can include crackers, peanut butter, puffed rice cakes, dry cereals or cereal bars, tortillas, or tortilla chips etc

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CHECK ON UNDERSTANDING

1. It is okay to neglect during-activity nutrition intake. (T/F)
2. What should you avoid consuming during exercise?
3. What is the mnemonic for low-GI-impacting carbohydrate foods recommended as during-exercise fuel intake?

RECOVERY NUTRITION

OBJECTIVES:

DESIRED OUTCOME (Leadership)

Cadets will embrace a healthy diet and apply nutritional facts, practices, and recommendations to their activity and exercise regimens.

Plan of Action:

8. Define recovery phase, post-workout and post-workout nutritional window

Essential Question:

How do we nutritionally recover after exercise, workout or fieldwork?

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Recovery Nutrition

- **Post workout** also known as the **recovery phase**
- **Key ingredients** specifically for post-workout to influence the best recovery:
  - Maltodextrin (white starcy additive used in food products)
  - Whey
  - Electrolytes.
- *Function:* glycogen (a form of glucose that stores energy) replenishment, and muscle recovery/ rebuilding
- Product examples for this phase are things like Gatorade G Series, Recovery drinks, and Powerbars for recovery

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Post-Workout Time & Aids

- **Post-workout nutrition window:** There is no exact time window or expectation to intake post-workout or recovery nutrients.
- **Post-workout drinks with ergogenic aids (ergogenic = enhancing physical performance)** have great success in body builders because the nutrients get shuttled into the muscles efficiently

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CHECK ON UNDERSTANDING

1. Post-workout is also known as _____ phase.

2. What are the functions of the nutrients during post-workout?
   a) Fat replacement
   b) Cool-down
   c) Hunger abatement
   d) Glycogen replenishment & muscle recovery

3. Post-workout nutrition window is a proven, specific timeframe (T/F)

NUTRITION FOR BUILDING MUSCLE

OBJECTIVES:

DESIRED OUTCOME (Leadership)

Cadets will embrace a healthy diet and apply nutritional facts, practices, and recommendations to their activity and exercise regimens.

Plan of Action:

9. Describe the nutrients needed for building muscle and ranges for minimum and maximum

Essential Question:

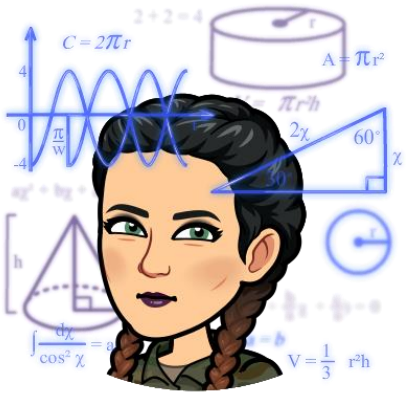
How do we use nutrition to build muscle mass?

Nutrition for Building Muscle

- Proteins inside the body repair muscles after a workout
- The types of protein are Meats, Poultry, Seafood, Eggs, Nuts & Seeds, and Beans & Peas
- Try to follow a diet based on your workout regimen and resulting nutritional needs.
  - Maintaining a balance of what the individual's body uses is key to building muscles. Bottom line is that body needs the correct amount of proteins that match the workload to fill the muscle fibers to build muscle.

Nutrition for Building Muscle

- Recommended daily protein intake is .8-1.2g/kg per day
- For example, a 165 lb person is roughly 75kg, they should intake:
  - minimum 75kg x.8= 60 grams of protein
  - maximum 75x 1.2= 90 grams of protein
  - For reference a 6oz steak is roughly 170 grams of protein (1 oz.=28.3grams).



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CHECK ON UNDERSTANDING

1. What is the minimum amount of protein an individual should ingest per day?
   a) 60 grams
   b) 90 grams
   c) .8 grams per kilogram of body weight
   d) 1.2 grams per kg of body weight

2. What nutrient does the body rely on to build muscles?

3. You should try to follow a diet based on your _____ regimen.

NUTRITION FOR ENERGY & AEROBIC ACTIVITY

OBJECTIVES:

DESIRED OUTCOME (Leadership)

Cadets will embrace a healthy diet and apply nutritional facts, practices, and recommendations to their activity and exercise regimens.

Plan of Action:

10. Execute calculations for energy needed for aerobic activity for an individual's weight
11. Explain the two required sources for energy

Essential Question:

What sources and how much per individual's body weight does one need to have enough energy for aerobic activity?

Nutrition for Energy & Aerobic Activity

- Aerobic activity is exercise that burns through calories during the activity.
- Aerobic exercise uses nutrition to make energy throughout the exercise
- Balanced nutrition is necessary for optimum performance.
- 2 required sources of energy are carbohydrates and proteins.
- Other types of calorie intake come from fats, sugars, and other micronutrients such as calcium, sodium and potassium.

Nutrition for Energy & Aerobic Activity

- Most important is that the recommended daily amount of Carbs is met: 5 to 12g/kg per day
- Example: 165lb person = roughly 75kg
  - The minimum amount of carbohydrates to be ingested is 75kg x 5g= 375 grams of carbohydrates and
  - The maximum recommendation is 75kg x 12g = 900 grams of carbohydrates

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Nutrition for energy & Aerobic Activity

Cereals and Grains* (Including Pasta and Rice)

Food	Serving Size
Barley, couscous, millet, pasta (white or whole-wheat, all shapes and sizes), polenta, quinoa (all colors), or rice (white, brown, and other colors and types)	⅓ cup
Bran cereal (twigs, buds, or flakes), shredded wheat (plain), or sugar-coated cereal	½ cup
Bulgur, kasha, tabbouleh (tabouli), or wild rice	½ cup
Granola cereal	¼ cup
Hot cereal (oats, oatmeal, grits)	½ cup
Unsweetened, ready-to-eat cereal	¾ cup

*Serving sizes for all grains and pasta measure cooked foods.

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Milk and Milk Substitutes

1 carbohydrate choice = 12 grams carbohydrate

Food	Serving Size
Milk (nonfat, 1%, 2%, whole)	1 cup
Rice drink, plain, fat-free	1 cup
Yogurt (including Greek), plain or sweetened with an artificial sweetener*	⅔ cup (6 oz.)

*Yogurt is highly variable in carbohydrate content, so check the food label to be sure.

Non-starchy Vegetables

1 serving = 5 grams carbohydrate

Food	Serving Size
Vegetables, cooked	½ cup
Vegetables, raw	1 cup
Vegetable juice	½ cup

Non-starchy vegetables include asparagus, beets, broccoli, carrots, cauliflower, eggplant, green beans, greens, (collard, dandelion, mustard, purslane, turnip), mushrooms, onions, pea pods, peppers, spinach, squash (summer, crookneck, zucchini), and tomatoes. Some vegetables, such as salad green (lettuce, romaine, spinach, and arugula), have so little carbohydrate that they are considered free foods.

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Bread

Food	Serving Size
Bagel	¼ large bagel (1 oz.)
Biscuit	1 biscuit (2½ inches across)
Bread, reduced-calorie, light	2 slices (1½ oz.)
Cornbread	1¾ inch cube (1½ oz.)
English muffin	½ muffin
Hot dog or hamburger bun	½ bun (¾ oz.)
Naan, chapati, or roti	1 oz.
Pancake	1 pancake (4 inches across, ¼ inch thick)
Pita (6 inches across)	½ pita
Tortilla, corn	1 small tortilla (6 inches across)
Tortilla, flour (white or whole-wheat)	1 small tortilla (6 inches across) or ⅓ large tortilla (10 inches across)
Waffle	1 waffle (4-inch square or 4 inches across)

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Crackers and Snacks

Food	Serving Size
Crackers, animal	8 crackers
Crackers, graham	3 crackers (2½ inch squares)
Crackers, saltine or round butter-type	6 crackers
Granola or snack bar	1 bar (¾ oz.)
Popcorn	3 cups, popped
Pretzels	¾ oz.
Rice cakes	2 cakes (4 inches across)
Snack chips, baked (potato, pita)	About 8 chips (¾ oz.)
Snack chips, regular (tortilla, potato)	About 13 chips (1 oz.)

Beans and Lentils

Food	Serving Size
Baked Beans	⅓ cup
Beans (black, garbanzo, kidney, lima, navy, pinto, white), lentils (any color), or peas (black-eyed and split), cooked or canned, drained and rinsed	½ cup

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Nutrition for energy & Aerobic Activity

Starchy Vegetables*

Food	Serving Size
Cassava, dasheen, or plantain	⅓ cup
Corn, green peas, mixed vegetables, or parsnips	½ cup
Marinara, pasta, or spaghetti sauce	½ cup
Mixed vegetables (with corn or peas)	1 cup
Potato, baked with skin	¼ large (3 oz.)
Potato, French-fried (oven-baked)	1 cup (2 oz.)
Potato, mashed with milk and fat	½ cup
Squash, winter (acorn, butternut)	1 cup
Yam or sweet potato, plain	½ cup (3½ oz.)

*Serving sizes for all starchy vegetable measure cooked vegetables.

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Sweets and Desserts

1 carbohydrate choice = 15 grams carbohydrate

Food	Serving Size
Brownie, small, unfrosted	1 ¼-inch square, ⅞-inch high (about 1 oz.)
Cake, unfrosted	2-inch square (about 1 oz.)
Candy, hard	3 pieces
Ice cream, regular	½ cup
Pudding, sugar-free or sugar-and fat-free (made with fat-free milk)	½ cup
Sandwich cookie with crème filling	2 small cookies (about ¾ oz.)

2 carbohydrate choice = 30 grams carbohydrate

Food	Serving Size
Candy, chocolate, dark or milk	1¾ oz.
Cupcake, frosted	1 small cupcake (about 1¾ oz.)
Doughnut, yeast-type, glazed	1 doughnut, 3¾ inches across (2 oz.)

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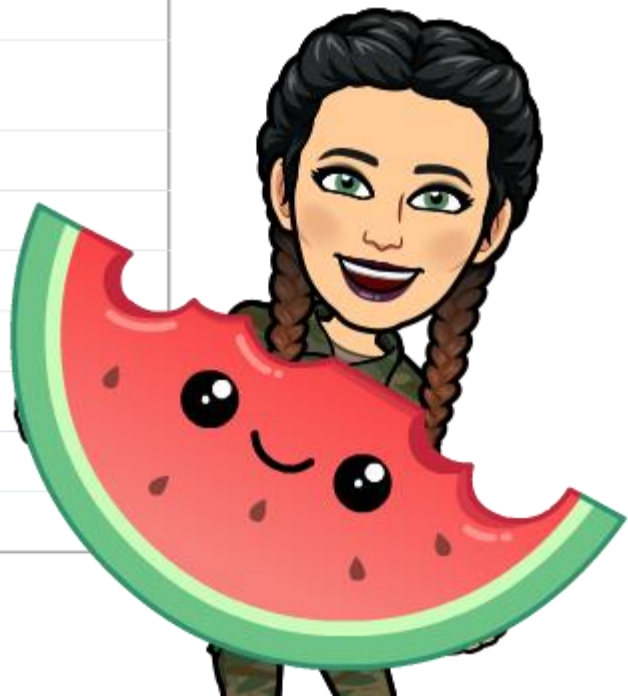
Nutrition for energy & Aerobic Activity

Fruits

1 carbohydrate choice = 15 grams carbohydrate

NOTE: the weights listed include skin, core, and seeds.

Food	Serving Size
Applesauce, unsweetened	½ cup
Banana	1 extra-small banana, about 4-inches long (4 oz.)
Blueberries	¾ cup
Dried fruits (blueberries, cherries, cranberries, mixed fruit, raisins)	2 Tbsp.
Fruit, canned	½ cup
Fruit, whole, small (apple)	1 small fruit (4 oz.)
Fruit, whole, medium (nectarine, orange, pear, tangerine)	1 medium fruit (6 oz.)
Fruit juice, unsweetened	½ cup
Grapes	17 small grapes (3 oz.)
Melon, diced	1 cup
Strawberries, whole	1¼ cup



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CHECK ON UNDERSTANDING

1. What is maximum recommended amount of grams for carbohydrates?
   a) 5 grams per kilogram of body weight
   b) 8 g/kg
   c) 12 g/kg
   d) 15 g/kg
2. The two required sources of energy are _____ and proteins.
3. What's the most important nutritional requirement to meet?

Preventing & Recovery from Dehydration

OBJECTIVES:

DESIRED OUTCOME (Leadership)

Cadets will embrace a healthy diet and apply nutritional facts, practices, and recommendations to their activity and exercise regimens.

Plan of Action:

12. Define and explain hypohydration, hyper hydration, and rehydration

Essential Question:

How do we avoid and recover from dehydration?

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Definitions

- **Euhydration** is the body in water balance.
- **Rehydration** is the process of absorbing fluids once a body is dehydrated.
- **Hypohydration** is the uncompensated or unreplenished loss of body water.
- **Hyperhydration,** also known as water intoxication or water poisoning, is defined by too much fluid ingestion.

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Table IV: American College of Sports Medicine guidelines on fluid and electrolyte replacement for physical activity[5,6]

Fluid and electrolyte recommendations for physical activity	
Before exercise	Pre-hydration should be initiated several hours before exercise to ensure fluid absorption and normal urine output. Beverages and sodium-containing and salted snacks can increase the sensation of thirst and retain fluids.
During exercise	Fluid programmes should be customised for each individual, based on body weight measurements before and after exercise. Athletes should aim to prevent > 2% body weight loss during exercise. Fluids should contain carbohydrates and electrolytes to maintain fluid balance and exercise performance..
After exercise	Normal meals and beverages will induce euhydration. If more rapid recovery is required, 1.5 l of fluid per kg body weight loss during exercise should be ingested. Beverages and snacks should contain sodium to help with rapid recovery, stimulation of thirst and fluid retention.

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Preventing Dehydration

- Drink .5 to 2 liters of water per hour
- During recovery phase, mix salt/sodium or drink recovery drinks

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CHECK ON UNDERSTANDING

1. What is the difference between hypo- and hyper- hydration?
2. Define rehydration.
3. How many liter per hour is recommended to ingest?

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WEIGHT MANAGEMENT

OBJECTIVES:

DESIRED OUTCOME (Leadership)

Cadets will embrace a healthy diet and apply nutritional facts, practices, and recommendations to their activity and exercise regimens.

Plan of Action:

13. Explain examples of all 3 levels of proactive weight management
14. Define obesogenic
15. Describe how weight management is an epidemic nationwide
16. Define the difference between vigorous and moderate activities/exercise

Essential Question:

How do we gain and maintain a healthy weight?

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Weight Management

- Weight management is commonly referred to as **diet**.
- **Obesogenic** is an atmosphere that promotes increased food intake, lack of physical activity and intake of non-healthy foods.
- Obesity is an ongoing epidemic in today's youth and bleeds into adulthood nationwide, so weight management skills and tools are crucial in having a long and healthy life.

3 Levels of Proactive Weight Management

- Developing good eating habits helps you to manage weight more proactively, through three levels:
  - **Individual level** choices like decreasing portions, eating low-calorie foods, and exercising regularly
  - **Community level** options selling low-calorie foods, eating locally grown fruits and veggies, and requesting more nutritious food from restaurants for their menus
  - **National level** which is supported through the encouragement of increasing the walkability of cities, increasing campaigns against obesity and affordability of healthy foods

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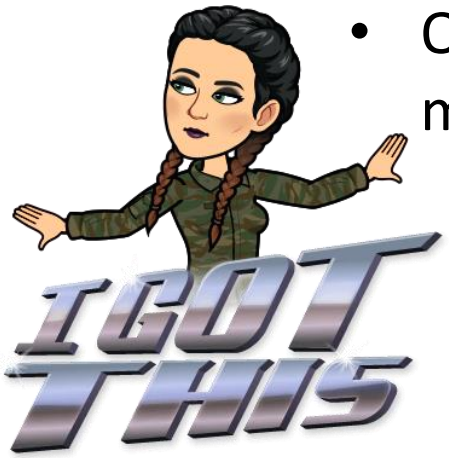
Dietary Recommendations

- Change eating patterns to a variety of vegetables, fruits, grains, fat-free or low-fat milk products, lean meat and feasible amount of oils.
- Create healthy eating patterns that limit saturated fats, trans fats, added sugars, and sodium.
- Ingest less than 10 percent of calories per day from added sugars and saturated fats and to not exceed 2,300 milligrams per day

Achieving Healthier Weight

- Increase your physical activity and frequency of exercise, and the intensity of exercise. Vary the types of exercise you do.
- Defining Activity:
  - **moderate activities** are when you can talk but not sing during exercise
  - **vigorous activities** are where you can say a few words but are unable to do so without having to catch your breath.
- Overall exercise and proper healthy diets are what makes weight management easier.



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Weight Management

INPUT VS OUTPUT

- Follow any doctor or health related recommendations
- Factors contributing to better weight management are energy balance, body weight and overall caloric output

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CHECK ON UNDERSTANDING

1. _____ is also known as weight management

2. What are the three levels of proactive weight management?

3. I can talk but not sing, what type of activity level is this?