

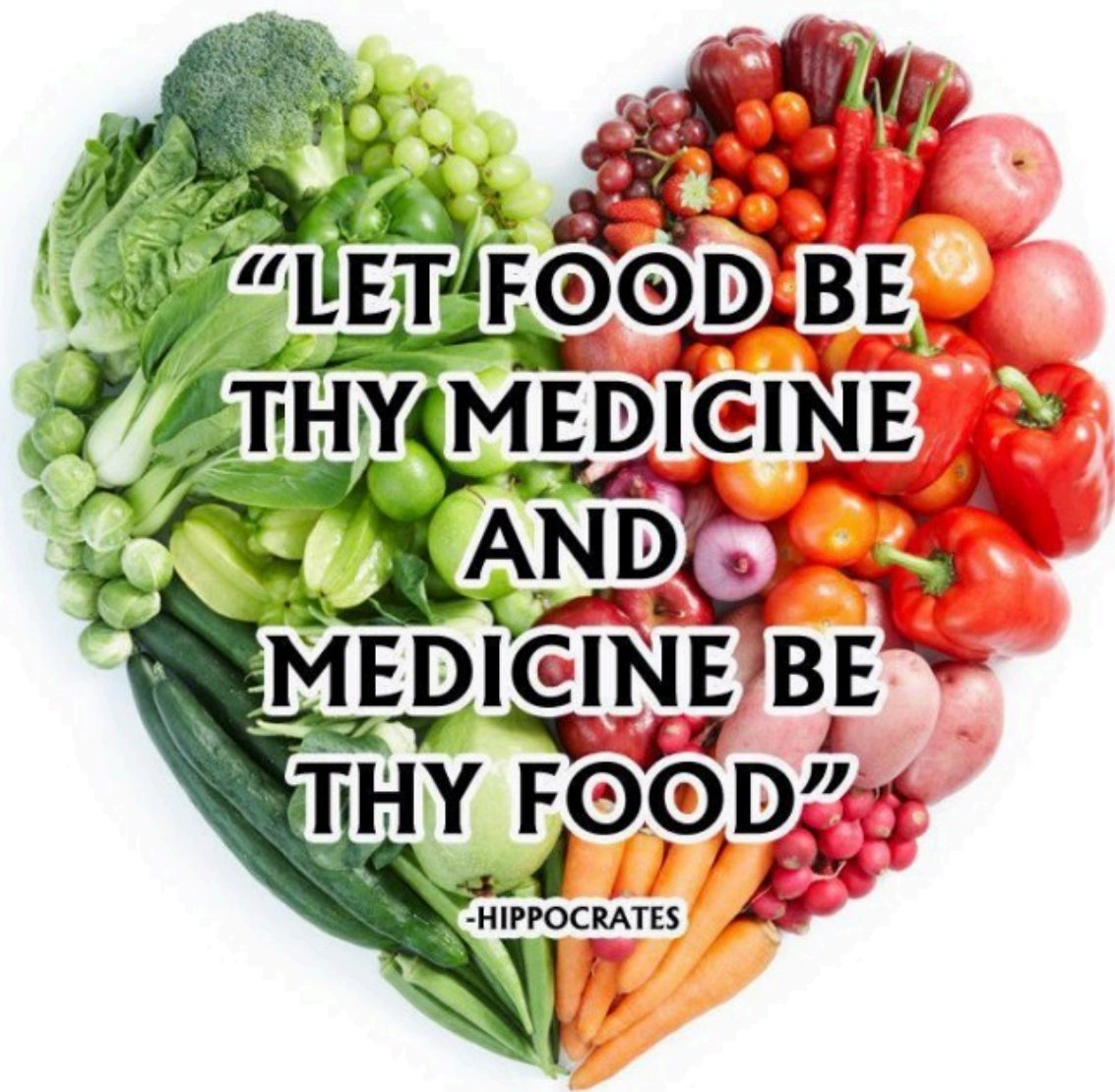
# **Eating Well When Unwell: A Guide for Patients and Families**

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Patient Centered Conference  
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# Objectives

- To identify the nutrients essential for proper nutrition
- To understand the benefits of good nutrition during and after cancer treatment
- To identify nutrition-related side effects that may occur during treatment and how to best handle them with nutrition interventions
- To be familiar with other nutritional recommendations for cancer treatment

# **A Well-Balanced Diet**



**“LET FOOD BE  
THY MEDICINE  
AND  
MEDICINE BE  
THY FOOD”**

**-HIPPOCRATES**

# Proper Nutrition

- **Food is our fuel**
- Consume the essential nutrients needed to carry out normal tissue growth and repair
- Can optimize the body's function by fueling with proper nutrition
- Foods provide **6 major nutrients** that provide energy, build and repair body tissue and regulate body functions

# “Eat Well”

- A healthy diet will help keep up your strength, prevent body tissue from breaking down, rebuild tissue, and maintain defenses against infection
  - Cope better with side effects
  - Handle higher doses of certain drugs
  - Some treatments work better in people who are well-nourished and are getting adequate calories and protein

# Eat a Variety of Foods

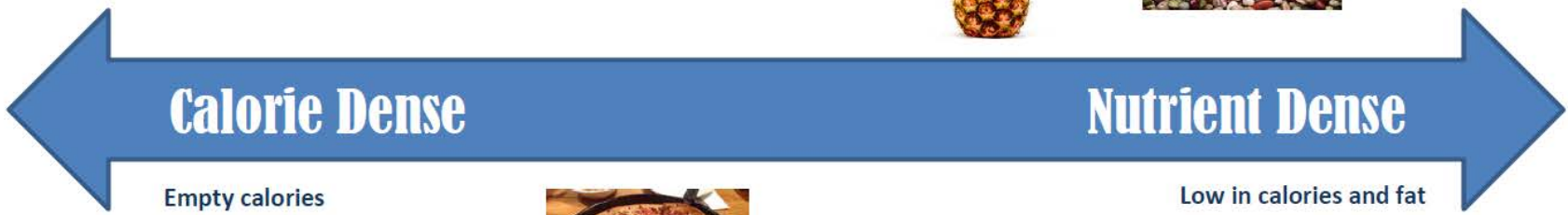
- Include foods from all food groups and in the right proportions
  - Grains
  - Vegetables
  - Fruits
  - Dairy
  - Protein
  - Fats
- Eat the Rainbow!



# Calorie vs. Nutrient Density

- Energy density: the number of calories in a specified amount of food
- Calorie dense foods: contain high levels of calories/serving
  - Empty calories, no nutritional value
  - Highly processed, added sugar, fat, salt
- Nutrient dense foods: contain high amounts of nutrients compared to calories (large amounts of water)
  - High in protein, carbohydrates, fiber, vitamins, minerals
- **Recommendation:** Eat nutrient dense foods and avoid high energy dense foods





**Calorie Dense**

**Nutrient Dense**

Empty calories

Low in calories and fat

High in vitamins and minerals



# Nutrients

- Protein
- Carbohydrates
  - Fiber
- Fats
- Water
- Vitamins
- Minerals

# Protein

- Needed for: growth, repair body tissue, healthy immune system
- Your body needs more protein with cancer
- Choose *lean* sources
- Sources: fish, poultry, lean red meat, eggs, low-fat dairy
- Plant sources: legumes, nuts and seeds
  
- When your body doesn't get enough protein, it can break down muscle for the fuel it needs
  - Takes longer to recover from illness
  - Can lower resistance to infection

# Carbohydrates

- Body's major source of energy
  - The main form of energy for the body that is broken down into glucose (blood sugar)
- Important to give the body fuel it needs for proper organ function and physical activity
- Types: Simple, Complex or Starches, Fiber
- Sources: fruits, vegetables, whole grains, dairy
  - Whole grains: 100% whole wheat bread, oatmeal, brown rice, whole wheat pasta
  - Fruits, fruit juices, vegetables, vegetable juices
  - Low-fat dairy

# Fiber

- Normalizes bowel function
- **Insoluble fiber:** move food waste out of the body quickly
  - Does not absorb much water → doesn't change when liquid is added to it
    - Example: celery
- **Soluble fiber:** binds with water in the stool to help keep the stool soft
  - Becomes “sticky” when it gets wet
    - Example: oats
- Soluble fiber is good for both diarrhea and constipation
- Foods high in insoluble fiber are best for constipation only

# Fiber

|                             | Soluble Fiber   | Insoluble Fiber (Roughage)  |
|-----------------------------|---|---|
| Name                        | Pectins, gums, mucilages  | Cellulose, hemicellulose, lignin  |
| What it does                | Dissolves in water → forming a gel in intestines  | Holds onto water → moving waste through intestines  |
| How it promotes good health | Binds to fatty substances in the intestines (lowering bad LDL cholesterol)<br><b>Good for both diarrhea and constipation.</b> | Helps push food through the intestines quickly, <b>promoting regularity and helping prevent constipation.</b>   |
| Where it's found            | Dried beans and peas, lentils, oats, barley, apples, bananas, citrus fruits, berries, pears, carrots                          | Whole-wheat products, wheat and corn bran, brown rice, oats, cauliflower, green beans, potatoes, broccoli, asparagus, carrots, zucchini, cucumbers, tomatoes, fruit skins |

# Fat

- Fat helps the body grow and develop
- Rich source of stored energy – body breaks down fats to release energy for use
- Protects and cushions cells, internal organs and skeletal system
- Fats required to absorb fat-soluble vitamins (A, D, E & K) and transport some vitamins through the blood
- Sources: polyunsaturated, monounsaturated, saturated, trans
  - Healthy, Unhealthy, Ugly

# Healthy Fat

- Lowers total and LDL “bad” blood cholesterol
- Polyunsaturated Fats (PUFA):
  - Corn oil, safflower oil, soybeans, and sesame seeds, walnuts, almonds, flaxseed (omega 6) and fish (omega 3)
- Monounsaturated Fats (MUFA):
  - Avocado, peanuts, seeds, canola oil and olive oil
- Notice these are almost all plant sources of fat



# Unhealthy Fat

- Saturated Fats: Fixed fats with a rigid structure that makes them solid at room temperature
  - Animal fats (lard, butter, meat, dairy) and plant sources (palm & coconut oil)
  - Raise LDL “bad” cholesterol and total cholesterol

# Ugly Fat

- Trans Fats: unsaturated fats that have been TRANS formed into saturated fats
  - Aka hydrogenated or partially-hydrogenated oils
    - Processed foods, pies, vegetable shortening
  - Raise LDL “bad” cholesterol and total cholesterol

# Water

- All body cells need water to function
- Dehydration occurs when you do not consume enough liquids or lose fluids through vomiting or diarrhea
- **Recommendation: eight 8 ounce glasses of liquid each day or amount prescribed by physician**

# Vitamins/Minerals

- A well-balanced diet usually gets plenty of vitamins/minerals
- During cancer-the unbalanced diet due to treatment side effects may be lacking in appropriate vitamins/minerals
  - Doctor/dietitian may suggest a daily multivitamin
  - Lack of oral intake for several weeks can result in vitamin/mineral deficiencies
  - Discuss with oncologist to see if taking a vitamin or supplement is beneficial
    - Mega-doses may cause harm or interact with treatment

# Antioxidants and Treatment

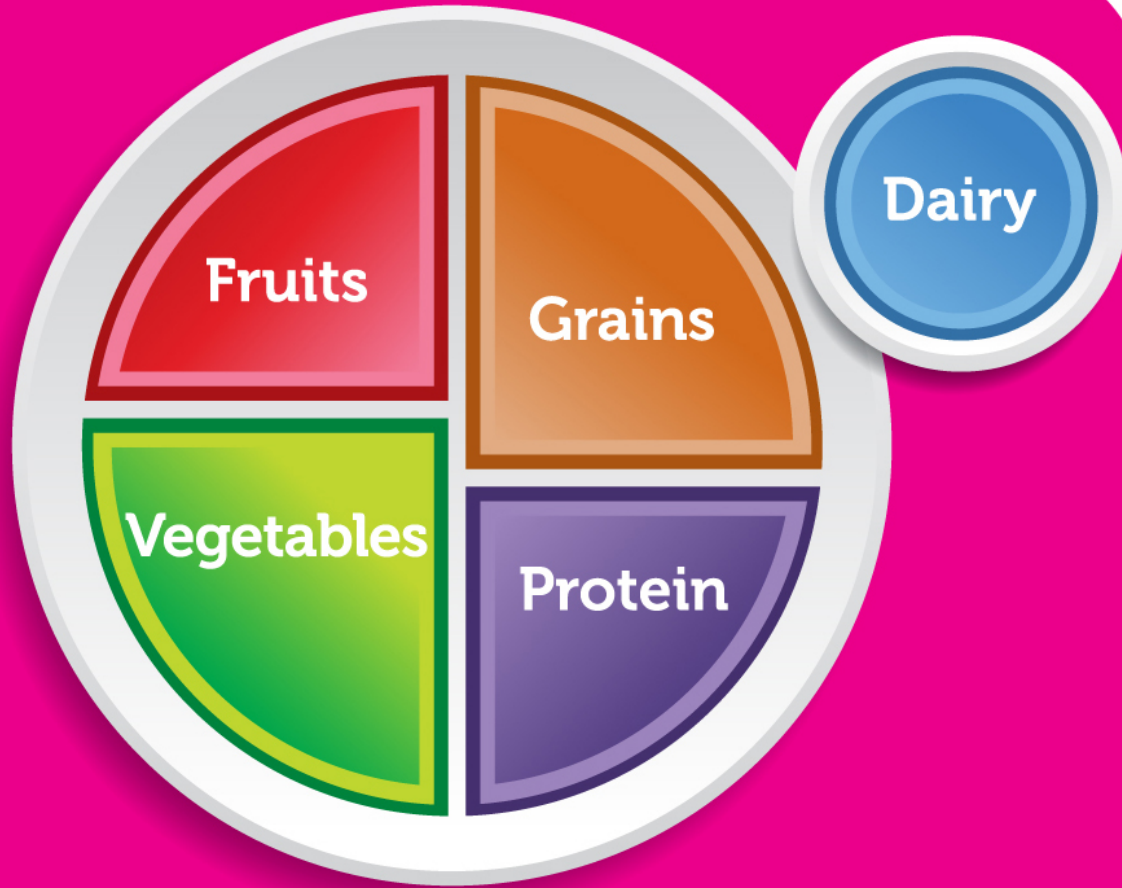
- Definition: natural substances that help prevent or stop cell damage caused by free radicals
- High in nutrients of Vitamin A,C, E, beta-carotene, lutein, lycopene, and selenium
- Controversial subject
  - Benefits vs. Risk
    - Benefit: Studies suggest that people who eat more vegetables and fruits, may have a lower risk for some types of cancer
    - Risk: taking antioxidant supplements may increase risk of cancer; concern that antioxidant supplements might interfere with cancer cell-killing treatments
      - Interfere with efficacy and/or increase risk of toxicity
- **Recommendation: consume through foods instead of supplements**

# Phytochemicals

- **Red**; *lycopene*: tomatoes, pink grapefruit, watermelon
- **Red/Purple**; *anthocyanins*: grapes, prunes, cranberries, blackberries, strawberries, red apples, red wine
- **Orange**; *carotenoids*: carrots, mangos, apricots, cantaloupe, pumpkin, acorn squash, winter squash, sweet potatoes
- **Orange/Yellow**; *beta cryptothanxin*: oranges, tangerines, peaches, papaya, nectarines, sweet potatoes
- **Yellow/Green**; *chlorophyll, indoles, lutein, zeaxanthin, folate*: spinach, collard, turnips, mustard green, yellow corn, green peas, avocados and honeydew melon
- **Green**; *indoles and sulforaphanes*: cabbage, broccoli, brussels, sprouts, and kale
- **White/Green**; *allicin, quercetin, and flavonoids*: leeks, onions, garlic, chives, white grape juice, white wine



| <b>Color</b>         | <b>Foods</b>                        | <b>Benefits</b>                        |
|----------------------|-------------------------------------|--|
| <b>Red</b>           | Tomatoes, watermelon, guava         | Lycopene: antioxidants                 |
| <b>Orange</b>        | Carrots, yams, mangos, pumpkins     | Beta-carotene: immune system           |
| <b>Yellow-orange</b> | Oranges, lemons, papayas, peaches   | Vitamin C: detoxify harmful substances |
| <b>Green</b>         | Spinach, kale, collards             | Folate: builds healthy cells           |
| <b>Green-white</b>   | Broccoli, Brussels sprouts, cabbage | Indoles, lutein: eliminate carcinogens |
| <b>White-green</b>   | Garlic, onions, chives, asparagus   | Allyl sulfides: destroy cancer cells   |
| <b>Blue</b>          | Blueberries, plums                  | Anthocyanins: destroy free radicals    |
| <b>Red-purple</b>    | Grapes, berries                     | Resverator: decrease estrogen          |
| <b>Brown</b>         | Whole grains, legumes               | Fiber: carcinogen removal              |



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# My Plate Recommendations

- Balances calories to manage weight
- Fill half of your plate with fruits and vegetables
- Make half of your grains whole grains
- Mix up your protein foods
- Choose low-fat or fat free milk
- Drink and eat less sodium, saturated fat and added sugars

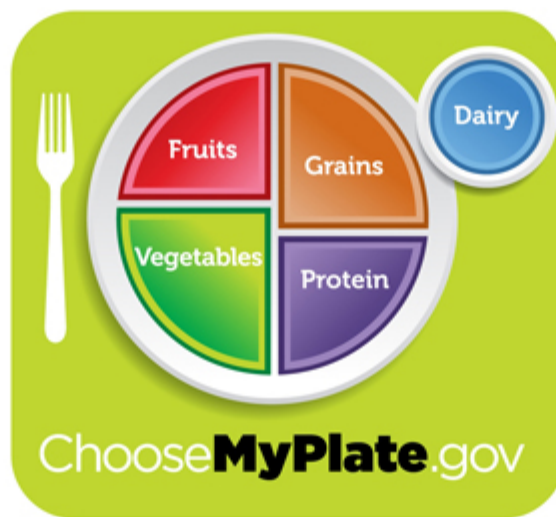


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**Balancing Calories**

- Enjoy your food, but eat less.
- Avoid oversized portions.

**Foods to Increase**

- Make half your plate fruits and vegetables.
- Make at least half your grains whole grains.
- Switch to fat-free or low-fat (1%) milk.

**I Want To...**

- Eat healthy on a budget
- Look up a food
- Learn about food groups
- Get a personalized Plan
- Learn healthy eating tips
- Get weight loss information
- Plan a healthy menu
- Analyze my diet
- Get MyPlate updates
- Ask a question

**Tip of the Day**

Grains are divided into 2 subgroups, whole grains and refined grains. Eat at least 3 ounces of whole-grain cereals, breads, crackers, rice or pasta every day.

[Click here for more tips](#)

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- Related Links
- Questions?

You are here: [Home](#) / [Food Groups](#) / [What foods are in the Grains Group?](#)

## Food Groups



### What foods are in the Grains Group?

Any food made from wheat, rice, oats, cornmeal, barley or another cereal grain is a grain product. Bread, pasta, oatmeal, breakfast cereals, tortillas, and grits are examples of grain products.

Grains are divided into 2 subgroups, **whole grains** and **refined grains**.

Whole grains contain the entire **grain kernel** — the bran, germ, and endosperm. Examples include:

- whole-wheat flour
- bulgur (cracked wheat)
- oatmeal
- whole cornmeal
- brown rice

Refined grains have been milled, a process that removes the

### Grains

- **What's in the Grains Group?**
- How much is needed?
- What counts as an ounce?
- Health benefits & nutrients
- Tips to help you eat whole grains
- Recipes

### Related Topics

- **Grains**
- Vegetables
- Fruits
- Dairy
- Protein Foods
- Oils
- Empty Calories
- Physical Activity

# Physical Activity/Movement

- Maintain muscle mass, strength, stamina, and bone strength
- Reduce stress, depression, and fatigue
- Improve appetite
- **Recommendation: aim for 150 minutes of moderate activity (walking) each week**
  - Listen to your body
  - Rest when needed
  - Remember: the more exercise you perform, the more calories you burn → may need to increase caloric intake to prevent weight loss

# **Nutrition During Treatment**

“Nutrition is an important part of cancer treatment. Eating the right kinds of foods before, during, and after treatment can help you feel better and stay stronger”

# What to Eat When?

- **Nutrition During Treatment**

- Goals:

- Prevent significant weight loss
- Modify diet to combat side effects that impact eating adequately

- **Nutrition and Recovery**

- Goals:

- Focus on healthy eating to help regain strength, rebuild tissue, and feel better overall
- Achieve and maintain a healthy weight

# Nutrition During Treatment

- The cancer and the treatment can change the way you eat
  - Also affect the way your body tolerates certain foods and metabolizes nutrients
- May need to alter your diet to help build strength and tolerate the effects of cancer and the treatment course
- The type of cancer, your treatment, and any side effects need to be considered when deciding the best ways to get the nutrition your body needs



# “Not Time to Lose Weight”

- 5% weight loss can:
  - Impair ability to cope with treatment side effects
  - Lead to malnutrition
    - Delay treatment

# Nutrition During Treatment

- Treatment plan (surgery, radiation, chemotherapy, hormone therapy, immunotherapy etc.) destroys cancer cells, but also damages healthy cells
  - Damage leads to cancer treatment side effects
- Side effects
  - Anorexia/poor appetite/early satiety
  - Sore mouth or throat
  - Dry mouth
  - Changes in taste or smell
  - Nausea
  - Vomiting
  - Diarrhea
  - Constipation
  - Fatigue
  - Depression

# A Registered Dietitian's Role

- Dietitian can help you get the proper nutrition during treatment
- Manage side effects and maximize nutrition during treatment
- Provide nutrition recommendations/recipes/ideas on how to meet your nutrition needs
- Help with meal planning for eating problems caused by treatment and diet restrictions from other medical problems (diabetes, heart disease, kidney disease etc.)

# Calorie and Protein Needs

- Stable Weight\*
  - 25 calories/kg body weight
    - Converting to kilograms:
      - Weight in lbs / 2.2 (ex: 135lbs/2.2 = 61.4kg)
  - 1.0-1.2gms protein/kg
- If Experienced Recent Weight Loss
  - 30-35 calories/kg
  - 1.2-1.5gms protein/kg
- Recommendations may vary based on
  - Amount of weight loss/gain
  - Alterations in organ function

\*If overweight, your weight may need to be adjusted to account only for your body mass that is metabolically active

# **HOW TO DEAL WITH COMMON EATING PROBLEMS DURING TREATMENT**

# Fatigue

- Due to not eating enough, lack of sleep, depression, low blood counts, and some medications
- Recommendations:
  - Prioritize activities
  - Move around or take short walks
  - Drink plenty of fluids
    - Dehydration can make fatigue worse
  - Get enough rest - take short naps or rest breaks during the day
  - Eat protein, fat, and fiber food source with each meal and snack to help keep blood sugar levels more stable
    - Banana + peanut butter
  - Work on stress management

# Appetite Changes

- Loss of appetite can lead to weight loss → weakness and fatigue
- Recommendations:
  - Eat smaller, more frequent meals (consume snacks)
  - Keep a variety of protein-rich snacks on hand that are easy to prepare and eat
  - Eat nutrient dense foods: high calorie/protein foods
  - Eat by the clock rather than waiting for hunger/satiety cues
  - Eat your biggest meal when you are the hungriest
  - Eat favorite foods anytime of the day
  - Consume high calorie/protein beverages/supplements
  - Avoid liquids with meals to keep from feeling full early
  - Consider an appetite stimulant: Megace, Marinol

# High Calorie Foods

- Butter
  - Melt over potatoes, rice, pasta, and cooked vegetables
  - Stir melted butter in soups and casseroles
  - Spread on bread or crackers
- Milk products
  - Add whipping or heavy cream to desserts, pancakes, waffles, fruits
  - Add sour cream to baked potatoes or vegetables
- Salad dressings
  - Use regular mayonnaise or salad dressing on sandwiches and vegetables
- Sweets
  - Add jelly and honey to bread and crackers



# High Protein Foods

- Milk products
  - Eat cheese on toast or with crackers
  - Add cheese to baked potatoes, soups, vegetables, noodles, meats
  - Use milk instead of water for hot cereal and soups
  - Include cream or cream sauces on vegetables and pasta
  - Add powdered milk to cream soups, mashed potatoes, puddings, casseroles
  - Add Greek yogurt, whey protein, or cottage cheese with fruits or create smoothies
- Eggs
  - Keep hard boiled eggs in the refrigerator
  - Make a quick egg salad (mayonnaise, oil, egg)
- Meats, poultry, fish
  - Add cooked meats to soups, casseroles, salads, omelets
- Beans, legumes, nuts, seeds
  - Sprinkle on salads, pastas, desserts
  - Spread peanut butter on bread/crackers or add to milkshakes

# Healthy Snacks:

## Protein + Carbohydrates

- Greek yogurt + berries
- Peanut/nut butter + apple
- Cottage cheese + sliced pears
- String cheese + crackers
- Hummus + raw vegetables
- Tuna salad/egg salad +pita bread

# Nausea/Vomiting

- Acute, delayed, or anticipatory
- Recommendations:
  - Eat smaller more frequent meals (6-8 snacks)
  - Eat dry, starchy and/or salty foods (crackers, toast, bread) every few hours
  - Eat foods that do not have strong odors
  - Eat cool foods instead of hot or spicy foods
  - Avoid foods that are overly sweet, greasy, fried, or spicy
  - Avoid favorite foods until symptoms resolve
  - Sip on clear liquids to prevent dehydration (broth, juice, popsicles)
  - Use peppermints, lemon drops, root beer barrels, ginger if there is a bad taste in your mouth

# Nausea Food List

| Food Type                        | Eat  | Avoid  |
|----------------------------------|--|--|
| High protein                     | Boiled or baked meat, fish, poultry, eggs, cream soups made with low-fat milk, low-fat yogurt  | Fatty and fried meats (sausage or bacon), fried eggs, high fat milkshakes                        |
| Breads, cereals, rice, and pasta | Saltines, crackers, bread, toast, cold cereal, English muffins, bagels, plain noodles and rice   | Doughnuts, pastries, waffles, pancakes, muffins  |
| Fruits and vegetables            | Potatoes (baked, boiled, mashed), juices, canned, fresh, frozen vegetables/fruits  | Potato chips, French fries, hash browns, breaded, fried, or creamed vegetables with strong odors |
| Drinks, desserts, other          | Cold fruit blends, soft drinks, sport drinks, iced decaf tea, sherbet, jello, pudding, popsicles, fruit ices, pretzels, vanilla wafers | Alcohol, coffee, rich cakes/pies, olives, creams   |

# Diarrhea

- Cancer treatment and certain medications can cause your bowels to move more often and become loose
  - Three or more loose stools per day = diarrhea
- Uncontrolled diarrhea can lead to dehydration, weight loss, poor appetite, and weakness/fatigue
- Recommendations:
  - Avoid high fiber foods (nuts, seeds, whole grains, legumes, dried fruits)
  - Avoid high fat, fried, and greasy foods
  - Avoid spicy or very sweet foods
  - Avoid lactose if milk products cause problems
  - Follow the BRAT Diet (bananas, rice, applesauce, toast)
  - Increase soluble fiber foods (applesauce, bananas, oatmeal, rice, sweet potatoes)
  - Drink 1 cup of liquid after each bowel movement
  - Drink and eat high sodium foods (soups, broths, sports drinks, crackers, pretzels)
  - Do not chew sugar-free gum or eat candies/desserts with sugar alcohol (sorbitol, mannitol, xylitol)

## Diarrhea Food List

| Food Type                        | Eat   | Avoid  |
|----------------------------------|---|--|
| High protein                     | Boiled or baked meat, fish, poultry, eggs, cheese, yogurt   | Fatty and fried meats (sausage or bacon), dairy products if cause upset              |
| Breads, cereals, rice, and pasta | Bread, rolls, pasta made from refined grains/white flour, cream of wheat, oatmeal, cornflakes   | Whole grain breads and cereals (bran, fiber one, shredded wheat), granola, wild rice |
| Fruits and vegetables            | Cooked vegetables: asparagus tips, beets, carrots, zucchini, mushrooms, tomato sauced, baked potato without skin, canned/frozen/fresh fruit | Fresh unpeeled fruits, dried fruit, all other vegetables                             |
| Drinks, desserts, other          | Decaffeinated beverages   | Popcorn, nuts, seeds, dried fruit, coconut, hot sauce, strong spices/odors           |

# Constipation

- Pain medication, changes in eating habits, being less active, lack of fluids can cause your bowels to move less often and stools may become hard to pass
- Recommendations:
  - Drink 8-10 cups of liquids per day
    - Prune juice, tea, hot lemonade
  - Set up a regular bowel plan-over the counter stool softener
  - Eat high fiber foods (whole grains/cereals, fruits and vegetables raw and with skins, dried beans)
  - Avoid gas containing foods
  - Avoid chewing gum and carbonated drinks to lessen the amount of air you swallow

# Foods That Might Cause Gas

- Apples (raw)
- Apple juice
- Asparagus
- Avocado
- Beans and peas (dried)
- Beer
- Broccoli
- Brussel sprouts
- Cabbage
- Cauliflower
- Collards
- Corn
- Cucumbers
- Eggs
- Fish
- Lentils
- Melons
- Milk
- Mushrooms
- Mustard
- Nuts
- Onions, leeks, scallions
- Peppers
- Pickles
- Sauerkraut
- Spicy foods
- Spinach
- String beans
- Strong cheese
- Sweet potatoes
- Turnip greens



# Dry Mouth and Thick Saliva

- The glands that make saliva can become irritated and make less saliva or the saliva becomes thick and sticky
- A dry mouth can increase the risk of mouth infections
- Recommendations:
  - Drink plenty of fluids, always carry a water bottle
  - Take small bites, chew foods well
  - Eat soft, moist foods that are cool or at room temperature
  - Avoid foods that stick to the roof of the mouth (peanut butter)
  - Moisten foods with broth, soups, sauces, gravy, yogurts, cream
  - Suck on sugarless candy or chew sugarless gum to stimulate saliva
    - Citrus, cinnamon, mint flavors
  - Perform good oral care hygiene
    - 1 quart water, 1 tsp salt, 1 tsp baking soda

# Dry Mouth Food List

| Food Type                        | Eat  | Avoid   |
|----------------------------------|--|---|
| High protein                     | Meats, poultry, fish in sauces/gravies, casseroles, stews                                    | Dry protein without sauces                                  |
| Breads, cereals, rice, and pasta | Bread, rolls, cooked or cold cereals with milk, rice soaked in gravy, sauce, broth, or milk  | Dry breads, rolls, pasta, rice, pretzels, chips, dry cereal |
| Fruits and vegetables            | Canned and fresh fruit with a lot of moisture (pears, peaches, oranges), vegetables in sauce | Dried fruit, raw vegetables                                 |
| Drinks, desserts, other          | All liquids, ice cream, milkshakes, smoothies, sherbet, pudding                              | Dry sweets  |

# Sore Throat and Mouth Sores

- Recommendations:
  - Avoid tart, acidic, or salty foods
  - Avoid pickled, vinegar, tomato-based foods
  - Avoid rough-textured or hard foods
  - Eat soft, creamy foods
  - Consume lukewarm or cold foods that are soothing (avoid hot)
  - Puree foods in a blender to make them easier to swallow
  - Tilt your head back to help foods and liquids flow to the back of the throat for swallowing
  - Drink through a straw to bypass the sores
  - Suck on ice
  - Avoid irritating spices like chili powder, curry, hot sauce, pepper
  - Avoid using mouthwashes that contain alcohol

## Sore Throat/Mouth Sores Food List

| Food Type                        | Eat   | Avoid   |
|----------------------------------|---|---|
| High protein                     | Soft blended meats/casseroles, ground/chopped meats, creamed soups, milkshakes , eggs | Spicy foods like tacos and chili                                      |
| Breads, cereals, rice, and pasta | Cooked/cold cereals   | Crackers, hard-crust breads   |
| Fruits and vegetables            | Soft non-acidic fruit and vegetables  | Citrus fruits and raw vegetables, pickled fruits/vegetables, tomatoes |
| Drinks, desserts, other          | Non-acidic juices (apple, pear nectar), decaffeinated drinks, pudding, gelatin        | Citrus juices, caffeinated drinks, vinegar, spices                    |

# Swallowing Problems

- Difficulty swallowing - dysphagia
- Pain with swallowing - odynophagia
- May be referred to a speech language therapist (SLP) to help teach you how to swallow better and decrease coughing and choking when eating/drinking
- Recommendations:
  - Listen to speech therapist for diet modifications and eating techniques
  - Chop or puree food in a blender or food processor
  - Use oral supplements if you are unable to eat enough to meet nutrition needs
  - May need to thicken liquids based on SLP evaluation

## Trouble Swallowing Food List

| Food Type                        | Pureed/full liquid diet  | Mechanical soft diet   |
|----------------------------------|--|--|
| Protein                          | Yogurt, cottage cheese, casseroles, scrambled eggs, pureed meats         | Milk, yogurt, cheese, eggs, ground meats                               |
| Breads, cereals, rice, and pasta | Cream of wheat   | Soft breads/cereals in milk, pancakes, waffles, pasta, rice with sauce |
| Fruits and vegetables            | Pureed without seeds and skins, mashed potatoes                          | Canned fruit, bananas, well-cooked vegetables                          |
| Drinks, desserts, other          | Thickened juices, milkshakes, ice cream, yogurt, puddings, creamed soups | All beverages, soft desserts   |

# Taste and Smell Changes

- Ageusia- very little or no sense of taste
- Dysgeusia- metallic, bitter, salty or sweet taste
- Hypogeusia – decreased sense of taste
  
- Recommendations:
  - Use plastic or glass eating utensils
  - Sugar-free gums or candies (or sweeteners) can eliminate bitter taste
  - Season foods with tart flavors (lemon, limes, vinegar, pickled)
  - Try flavoring foods with new tastes or spices
    - You may develop new flavor preferences during treatment
  - Use marinades on meats
  - Counter a salty taste with sugar and a sweet taste with lemon/salt
  - Practice good oral hygiene
  - Keep your mouth clean and brush your teeth

# **Special Diet Recommendations**



# Diet for Weakened Immune System

- Treatment can weaken your immune system by affecting the blood cells that protect against disease
- Your body cannot fight infection, foreign substances, and disease as well as a healthy person's body
- No specific foods or diets are proven to increase production of white blood cells → can avoid exposure to infections
  - Practice good hygiene
  - Hand-washing
  - Food safety practices

# Nutrients for the Immune System

- **Vitamin A** helps regulate the immune system and protects from infections by keeping skin and tissues in the mouth, stomach, intestines and respiratory system healthy
  - Sources: sweet potatoes, carrots, kale, spinach, red bell peppers, apricots, eggs or foods labeled "vitamin A fortified," such as milk or cereal.
- **Vitamin C** protects you from infection by stimulating the formation of antibodies and boosting immunity
  - Sources: citrus fruits such as oranges, grapefruit and tangerines, or red bell pepper, papaya, strawberries, tomato juice or foods fortified with vitamin C, such as some cereals
- **Vitamin E**: antioxidant, neutralizes free radicals and may improve immune function
  - Sources: fortified cereals, sunflower seeds, almonds, vegetable oils hazelnuts, peanut butter or spinach
- **Zinc** helps the immune system work properly
  - Sources: lean meat, poultry, seafood, milk, whole grain products, beans and nuts

# Neutropenic Diet

- ***Aka: Reduced Bacteria Diet, Sterile Diet, Low-Microbial Diet, Low Bacteria Diet, Fresh Food Precaution Diet***
- Decreases risk for food-borne illnesses while immunosuppressed
- Guidelines vary from institution to institution
  - Very strict: When ANC is less than 1000, no skinned fruits or raw vegetables
  - ***Less strict: General Food Safety Diet Practices***
- \*Most facilities are no longer supporting the neutropenic diet because the research is not strong to support avoiding fruits and vegetables
  - CDC and FDA do not support neutropenic diet because of the lack of evidence

# Food Safety Nutrition Therapy

- Nutrition therapy addresses the food safety concerns of individuals whose immunity is suppressed and who are at high risk for foodborne illness
- Handout provided by dietitians: guidelines for which foods to eat and which foods to avoid to lower your risk of foodborne illness, tips for how to handle fresh fruits and vegetables, and proper cooking temperatures to keep your food safe
- Guidelines vary from institution to institution

 Academy of Nutrition  
and Dietetics

|               |  |          |  |
|---------------|--|----------|--|
| Prepared For: |  | Date:    |  |
| Prepared By:  |  | Contact: |  |

**Food Safety Nutrition Therapy**

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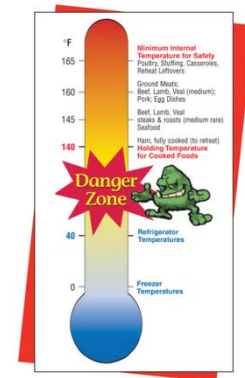
# Food Safety Food List

| Food Type                       | Consume   | Avoid  |
|---------------------------------|---|--|
| Meat, poultry, fish, tofu, nuts | <ul style="list-style-type: none"><li>• All protein cooked thoroughly</li><li>• Vacuum-sealed nuts</li><li>• Shelf-stable nut butters</li></ul> | <ul style="list-style-type: none"><li>• Raw or uncooked meats</li><li>• Raw fish, shellfish, sushi, lox</li><li>• Raw nuts or fresh nut butters</li></ul>  |
| Eggs                            | <ul style="list-style-type: none"><li>• Cook eggs until yolks and whites are solid</li><li>• Pasteurized eggs</li></ul>                         | <ul style="list-style-type: none"><li>• Raw eggs (over-easy, poached, soft-boiled, sunny side up)</li></ul>  |
| Milk and dairy                  | <ul style="list-style-type: none"><li>• Pasteurized milk, yogurt, cheese, and other dairy products</li></ul>                                    | <ul style="list-style-type: none"><li>• Cheeses with molds (blue, Stilton, Roquefort, gorgonzola)</li><li>• Sharp cheddar, brie, farmer's cheese</li></ul> |

# Food Safety Food List

| Food Type                   | Consume   | Avoid  |
|-----------------------------|---|--|
| Breads, cereal, rice, pasta | <ul style="list-style-type: none"><li>• Safe to eat as long as they are purchased as wrapped, pre-packaged items</li></ul>  | <ul style="list-style-type: none"><li>• Uncooked grained products</li><li>• Self-service breads, rolls, pastries</li></ul>       |
| Fruits/vegetables           | <ul style="list-style-type: none"><li>• Needs to be washed thoroughly or lightly scrubbed with a vegetable brush</li><li>• Shelf-stable dressings/salsa</li></ul> | <ul style="list-style-type: none"><li>• Raw F/V</li><li>• Raw vegetable sprouts (alfalfa, radish, broccoli, mung bean)</li></ul> |
| Dessert and sweets          | <ul style="list-style-type: none"><li>• Commercially prepared jams/jellies</li><li>• Commercially prepared dairy products</li></ul>                               | <ul style="list-style-type: none"><li>• Unrefrigerated cream-filled pastries, raw honey or honeycomb</li></ul>                   |
| Water and beverages         | <ul style="list-style-type: none"><li>• Bottled water,</li><li>• Pasteurized fruit/vegetable juices, soda, coffee, tea</li></ul>                                  | <ul style="list-style-type: none"><li>• Well water</li><li>• Cold brewed tea</li></ul>   |

# Serving and Storing Foods Safely



- Avoid Foods in the “Danger Zone”
  - 40°F - 140°F
  - Bacteria that cause food borne illness grow rapidly at these temperatures
- Keep hot foods hot (warmer than 140°F) and cold foods cold (cooler than 40°F)
- Put a thermometer into the middle of the thickest part of the food to test for doneness
- Thermometer’s accuracy - read at 212°F in boiling water
- Cook meat until it’s no longer pink and the juices run clear
  - Meat 160°F
  - Poultry 180°F
- When in doubt, throw it out

# Store and Prepare Foods Safely

- Wash your hands thoroughly with warm, soapy water after handling raw meat
- Thaw meat, fish, or poultry in the refrigerator or microwave
  - Do not thaw at room temperature
- Put perishable foods in the refrigerator within 2 hours of buying/preparing them
  - Eggs/cream dishes - no more than 1 hour
- Do not keep refrigerated leftovers for more than 48 hours
- Wash fruits and vegetables well under running water
  - Can use a vegetable scrubber
- Do not eat raw vegetable sprouts
- Throw out foods that look or smell strange



# Do Not Cross-Contaminate

- Use a clean knife to cut different foods
- Store raw meat sealed, and preferably below, ready-to-eat food in the fridge
- Use a different cutting board for raw meats
- Clean counters and cutting boards with hot, soapy water

# Grocery Shopping

- Check “sell-by” and “use-by” dates
- Do not eat foods that are bought from self-serve or bulk containers
- Do not eat free food samples
- Refrigerate groceries right away, do not leave in a hot car

# Dining Out

- Ask that foods be prepared fresh
- Choose hot items to ensure they are cooked at the right temperatures
  - Cold items can be sitting out for a while and not handled properly
- Avoid buffet style restaurants/salad bars/delicatessens
- Ask for single-serving condiments, avoid self-serve bulk condiment containers
- Leftovers: ask for a container for you to put the food into, do not have the food be brought back to the kitchen

# Anemia

- A deficiency in the size or number of red blood cells or the amount of hemoglobin they contain
- Reduced amount of oxygen that is carried around in the bloodstream
  - Main role of iron is to carry oxygen around the body
  - Extensive blood loss, excessive blood cell destruction, or decreased blood cell formation
  - Caused by lack of nutrients (iron, folate, Vitamin B12) or cancer/cancer treatment
- Not all anemias are related to a deficiency in dietary factors

# Iron Food Sources

## Heme Iron

- High absorption
- Animal sources
  - Clams, oysters, mussels
  - Liver
  - Beef
  - Turkey
  - Sardines
  - Shrimp

## Non-Heme Iron

- Less available for absorption
- Vegetable sources
  - Enriched breakfast cereals
  - Cooked beans, lentils
  - Pumpkin seeds
  - Baked potato (w/skin)
  - Spinach

# Enhancing Iron Absorption

## **AVOID 2hrs before or after**

- Antacids
- Red Wine, Coffee, Tea, Colas
- Calcium containing foods (no milk with meals); dairy products (yogurt, cheeses, cream sauces)
- Spinach, chard, beet greens, rhubarb
- Whole grains, bran
- Soy products

## **To Enhance Absorption, Consume:**

- Meat, Poultry, Fish
  - (Heme iron)

## **WITH**

- Sources of Vitamin C
  - Orange, orange juice, red/green bell peppers, strawberries, broccoli, sweet potato, pineapple, tomato, tomato juice, brussels sprouts, cantaloupe

# Sources of Folate & Vitamin B12

## Folate

- Citrus juices and citrus fruits
- Bananas
- Dark-green leafy vegetables
- Legumes (beans, lentils, peanuts)
- Enriched breads, cereals, and pasta

## Vitamin B 12

- Meat
- Milk and Dairy products

# Steroids During Treatment

- Increased appetite
- Weight gain
- Bone mass loss
  - Calcium
  - Magnesium
  - Vitamin D
  - Vitamin K



# Strengthen Bone Health

- **Calcium**
  - 1,000 mg per day; >50yrs: 1,200 mg per day
    - Do not exceed 2,000-2,500 mg per day
  - Dairy foods, green vegetables (sources), fortified foods
- Calcium Supplements
  - Calcium Carbonate (e.g. Tums, Oscal, Citrate)
    - Take with meals as requires stomach acid
    - Label should read USP assuring that it will digest in normal stomach acidity
  - Calcium Citrate (e.g. Citracal)

# Strengthen Bone Health

- **Vitamin D**
  - Necessary for calcium absorption
  - 600 IU/day (19-70 yr old); 800 IU/day(>71 yr old)
  - Upper limit: 4000 IU/day
  - Sources of Vitamin D
    - Glass of milk: 100 IU; Fresh Salmon: 600-1000 IU; Most MVI: 400 IU; Sunbathing in summer: 10,000 – 20,000 IU
- **Phosphorus**
  - Dairy (milk, cheese), chocolate, colas
- **Magnesium, Vitamin K, Vitamin B6, Vitamin B12**
  - Available from a well-balanced diet

# Other Nutritional Considerations

# Dietary Supplements and Treatment

- What are Dietary Supplements?
  - Examples: vitamins, minerals, herbs, or products made from plants, animal parts, algae, seafood, or yeasts
- Should never replace prescribed medications or food
- Very few government standards to ensure the safety, effectiveness and quality of supplements
- Many supplements contain higher levels than the amounts found in food
- May be higher than what is recommended for good health
- Natural does not = Safe
- Can interfere with drug metabolism or absorption during chemotherapy, radiation, and even surgery

<http://ods.od.nih.gov>

American Cancer Society, <http://www.cancer.org/Treatment/TreatmentsandSideEffects/ComplementaryandAlternativeMedicine/DietarySupplements/index>

# Dietary Supplements and Treatment

- Talk with your doctor/oncologist
  - Gather as much information about the supplement and ask for an open conversation
- Many cancer experts advise patients not to take supplements during treatment
- Only recommend when it is necessary to treat a deficiency (osteoporosis or anemia)

# Probiotics

- “Good Bacteria”
- Definition
  - "live microorganisms administered in adequate amounts which confer a beneficial health effect on the host" – FAO/WHO
- U.S. Food and Drug Administration (FDA) has not approved any health claims for probiotics.
- 70% of our immune system resides within our gut
- Sources: foods (yogurt) or dietary supplements
- **Talk with you doctor before taking any probiotics, especially if you have a low white blood cell count**

# Sugar and Cancer

- **“Sugar-feeds-cancer” myth**
  - Based on misconception of PET scans
  - Body’s main energy source is glucose
    - Every cell in the human body requires glucose
    - Glucose feeds every cell in the body
  - All carbohydrate sources are broken down to simple sugars
    - Even without carbohydrates, your body will make sugar from other sources (protein and fat)
  - Everything in moderation
    - Recommend decreasing refined sugars and sweets, eat more natural forms of sugar (example fruit and dairy) as they provide a greater nutritional value

# **Nutrition After Treatment-Recovery**



# Nutrition After Treatment Ends

- After treatment, may still have symptoms or side effects that affect your health status
  - Take some time to recover
- **GOAL: weight maintenance, a physically active lifestyle and a healthy diet**
- If you lost weight
  - Nutrition counseling will focus on regaining weight to achieve a normal, healthy weight
- If you are overweight or obese
  - Nutrition counseling will focus on a healthy lifestyle and weight

# American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Survivors

- Get to and stay at a healthy weight based on BMI
  - Limit high-calorie foods (calorie density)
  - Drink fewer beverages with added sugar
  - Eat more fruits and vegetables (nutrient density)
- Be active
  - Avoid being inactive and return to normal daily activities
  - Exercise at least 150 minutes/week
  - Include strength training 2 days/week
- Eat a variety of healthy foods from plant sources
  - Limit processed meat
  - Eat 2.5 cups or more of vegetables and fruits each day
  - Choose whole grains rather than refined grains

# Registered Dietitian

- A Registered Dietitian (RD) can help you evaluate and prioritize your overall nutritional needs based on your medical history and personal goals
- Many cancer centers employ RDs who are Certified Specialists in Oncology nutrition (CSO)
  - Call your cancer center for a recommendation and referral
- Find an RD elsewhere:
  - [eatright.org/programs/rdfinder](https://eatright.org/programs/rdfinder)

# Recipes

# Basic High Protein Drink

- **Serves 1; 12 ounces**
- **Ingredients:**
- 1 packet Carnation Instant Breakfast
- 1 cup whole milk (or low-lactose milk if you are on a low-lactose diet)
- ½ cup vanilla ice cream (add flavorings or different flavor ice creams for variety)
- **Instructions:**
- Blend ingredients in a blender until smooth
- **Nutritional Value:**
- Calories: 530
- Protein: 23 g



# Orange Sherbet Shake



- **Serves 1, 12- ounce glass**

- **Ingredients:**

- 1 cup orange sherbet
- $\frac{3}{4}$  cup whole milk
- $\frac{1}{2}$  cup raspberries, frozen
- $\frac{1}{2}$  tsp vanilla extract
- 1 scoop vanilla protein powder

- **Instructions:**

- Place all ingredients in a blender container
- Cover and blend on high speed until smooth
- Chill before serving

- **Nutritional Value:**

- Calories: 574
- Fat: 14 g
- Carbohydrate: 80 g
- Protein: 32 g

# Okra Soup



- **Serves 4, Serving Size: 1 cup**

- **Ingredients:**

- 4 quarts water
- 2 large chicken or vegetable bouillon cubes
- 1 pound okra
- 1-2 cups cooked orzo or fine pasta

- **Fun facts:**

- Okra is high in soluble fiber, vitamin C, folate, calcium, and potassium
- Sticky/slime texture when cooked
  - Coat the throat, making it easier to swallow

- **Instructions:**

- Wash the okra and cut the two ends off
  - For stronger, more gelatinous soup, slice the okra into smaller pieces.
- Add chopped okra to pot; add 4 quarts of water and chicken or vegetable bouillon and bring to a boil. Simmer for one hour
- After boiling, remove all okra to avoid small seeds
- Add orzo or any fine pasta

- **Nutritional Value:**

- Calories: 67-95
- Fat: 10.5 g
- Carbohydrate: 17-25 g
- Protein: 3.5-5 g

# Quinoa Kale Cakes



- **Serves 6, Serving Size: 2-3 ounce cakes**

- **Ingredients:**

- 1 cup quinoa, uncooked
- 2 cups low sodium vegetable base bouillon
- 3 whole eggs, beaten
- 1/2 cup parmesan cheese, grated
- 1/2 cup green onions, sliced thin
- 2 tsp olive oil
- 1/2 cup onion, finely chopped
- 2 tsp of garlic, minced
- 3 1/2 cups kale, cleaned, diced
- 2/3 cups panko breadcrumbs, finely ground
- 1/2 tsp black pepper

- **Instructions:**

- Combine the quinoa with vegetable base bouillon and cook until liquid is absorbed.
- Cool the quinoa; combine quinoa with eggs, cheese and green onions.
- Sauté the onions, and garlic in olive oil until tender.
- Add the kale and sauté 1 minute until bright green.
- Transfer to a bowl and cool.
- Combine the quinoa mixture with the kale.
- Add the breadcrumbs and black pepper and gently mix together. 8. Form into 3-ounce patties.
- Cover and chill until needed.
- Sear patties on both sides on flat griddle to golden brown.
- Finish in 350° oven as needed.

- **Nutritional Value:**

- Calories: 279
- Fat: 12 g
- Carbohydrate: 33 g
- Protein: 14 g



# Greek Chicken with Tomatoes, Peppers, Olives, Feta

- **Serves 8**

- **Ingredients:**

- 4 boneless, skinless chicken breast halves, cut into bite-sized pieces
- 1/4 cup flour
- 8 teaspoons Greek seasoning salt, divided
- 1 teaspoon olive oil
- 1 large onion, sliced lengthwise
- 1 green pepper, cored, seeded, and sliced lengthwise into strips
- 3 Roma tomatoes, cut into eighths
- 3 tablespoons Kalamata olives, chopped
- 3 tablespoons feta cheese, crumbled
- How to make Greek seasoning salt
  - 2 teaspoons of garlic salt, 2 teaspoons of lemon pepper, 2 teaspoons of oregano, and 2 teaspoons of dried mint.

- **Instructions:**

- Dredge chicken in flour mixed with 4 teaspoons of Greek seasoning.
- Heat oil in a large skillet over medium heat and add chicken, sautéing for 3 to 4 minutes until cooked through.
- Remove chicken from pan and set aside.
- Add onion to skillet and sauté until tender, about 2 minutes. Add bell pepper and cook another 2 minutes.
- Return chicken to skillet and cook 1 to 2 minutes, sprinkling with remaining Greek seasoning. Mix in tomatoes.
- Remove from heat, transfer to serving dish, and sprinkle with olives and feta cheese.

- **Nutritional Value:**

- Calories: 210
- Fat: 9.5 g



# Dark Chocolate Avocado Mousse



- **Serves 2; Serving Size: ½ cup**
- **Ingredients:**
  - 1 medium avocado
  - ½ cup dark semi sweet chocolate chips
  - ¼ cup sugar
  - ¼ cup cocoa powder, unsweetened
  - 1 tsp cinnamon
  - 1 tsp vanilla extract
  - 1/3 cup raspberries
- **Nutritional Value:**
  - Calories: 497
  - Fat: 31 g
  - Carbohydrate: 50 g
  - Protein: 4.5 g
- **Instructions:**
  - Halve the avocado and scoop the flesh into a food processor or blender
  - Place the chocolate chips in a microwavable bowl, melt for 45 seconds-1 minute
  - Add the sugar, cocoa powder, cinnamon, and vanilla extra to the chocolate and mix until smooth
  - Add the chocolate mixture to the avocado flesh and blend until smooth
  - Scoop the avocado chocolate mousse into glasses or ramekins
  - Refrigerate for at least 30 minutes before serving
  - Add 1-2 raspberries as topping

# Recipe Idea Cookbooks

- American Cancer Society. *American Cancer Society's Healthy Eating Cookbook: A Celebration of Food, Friends, and Healthy Living*. 2<sup>nd</sup> ed. Atlanta, GA: American Cancer Society; 2001.
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- American Cancer Society, <http://www.cancer.org/Treatment>
- National Cancer Institute, <http://www.cancer.gov/about-cancer/>

**Questions?**