Nutrition During and After Treatment

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University Hospitals
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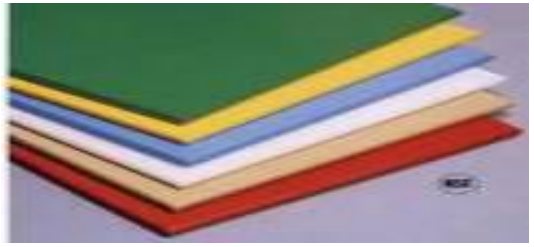
Topics to be covered

- During treatment
  - Food Safety
  - Nutrition goals
  - Sugar
  - Ketogenic diet
  - Vegan diet
  - Impact of treatment on nutrition
- After treatment
  - Nutrition Goals
  - Gluten free diets
  - Organic
  - GMO

Food Safety



Food Safety

- Goal is prevention of food borne illnesses
- A food borne illness is any illness caused by eating a food that is contaminated with bacteria, virus, mold or parasite.
- Sources of a food borne illness can be:
  - The food
  - The handler
  - The environment

Food Safety

- Steps to Food Safety:
  - Wash hands and surfaces often
  - Avoid cross contamination
  - Keep foods at safe temperatures

Food Safety

- Tools for food safety:
  - Food and refrigerator thermometers
    - a refrigerator thermometer should read 40 degrees or less
    - Cooking temperature for meat is 160 to 180 degrees
    - Holding temperature is 140 degrees or greater
  - Hand soap
  - Clean cloth (replace daily) or paper towels
  - Beach solution (1/3 cup household bleach with 3 and 1/3 cups water)

Food Safety

- Cutting boards:
  - Sanitize every time after cutting raw meat
  - Sanitize once weekly for other purposes
  - Sanitize by soaking in bleach solution for 2 minutes, rinse and air dry
- Do not cross-contaminate
  - Cutting boards and knives
  - Clean plates for cooked meat when grilling
- Check “Sell By” and “Use By” dates

Food Safety

Fruit and vegetable handling:

- **"Organic" and "natural" produce needs to be handled in the same manner as all raw produce-- those terms have no relationship to the cleanliness of the product.**
- **Do not purchase product pre-cut**
- **Commercial rinses are not recommended as they have not been proven to be more effective than running water**

Diet During Treatment

- Main goals during treatment
  - Maintain weight or have gradual weight loss if appropriate
  - Adequate protein intake
  - Adequate hydration
  - Try to eat as balanced a diet as possible

Does Sugar feed my cancer?

- **Yes and no**
- **Controversy and Confusion**
  - **Books and internet say, “avoid”.**
  - **Medical team says, “eat what you want”.**
- **Sugar in the form of glucose feeds every cell in our body**
  - **Even if you did not eat sugar- or carbohydrates- your body would convert fat and protein to glucose**
- In general, however, large amounts of simple sugars are not recommended!

- Glycemic index is a number that tells you how much a food will raise your blood sugar
  - **The higher the number, the more quickly the carbohydrate in the food will raise your blood sugar**
  - **Usually, the more complex the food is (if it contains fiber, fat and protein) the lower the glycemic index will be.**

Does sugar feed my cancer?

- **Research is showing that it is sugar's relationship to higher insulin levels and related growth factors that may influence cancer cell growth the most, and increase risk of other chronic diseases.**
- Many types of cancer cells have plenty of insulin receptors, making them respond more than normal cells to insulin's ability to promote growth.

Sugar

- Most Americans eat 22 tsp per day

- Guidelines from the American Heart Association:
  - Women: 6 tsp per day (25 g) of sugar to provide 100 calories
  - Men: 9 tsp per day (37g) of sugar to provide 150 calories per day

- Increase intake of low glycemic foods like most fruits, vegetables, dried beans and dairy products.
- Choose foods as close as you can to their natural state
- Include protein with carbohydrates (Avoid naked carbohydrates)
- Limit intake of high glycemic foods like breads, refined cereals, potatoes, white rice and sweet beverages.
- Spread carbohydrate intake out
- Choose Fruit over juice

Ketogenic Diet

- 4:1 ratio of fat to carbohydrate and protein
- Typical day of total net carbohydrates in a day would be 9 grams
- This diet has compliance issues and has been "liberalized" to a Modified Atkin's Diet that would have 20 grams of net carbohydrate.

Modified Atkin's Diet

- The Modified Atkins Diet (MAD) is a low carbohydrate, high fat, moderate protein diet. It is based on the induction phase of the Atkins diet originally designed for weight loss in adults.
- The purpose of the diet is to increase the body's dependence on fat rather than glucose for energy. This high fat diet causes the body to burn fat for energy.

Modified Atkin's Diet

- Typical "American" Diet
  - Fat 30 -35%
  - Protein 15 to 20%
  - Carbohydrate 50-55%
- Recommendation for Cancer survivors:
  - Fat 20 to 35%
  - Protein 10 to 35%
  - Carbohydrates 45 to 65%
- Modified Atkins Diet
  - Fat 65%
  - Protein 25-35%
  - Carbohydrate 2-5%

Vegan diet

- In this diet you avoid ALL animal products
- There are degrees to vegetarians-
  - Lacto-vegetarian: diet includes dairy
  - lacto-ovo vegetarian: diet includes dairy and eggs
  - Pescatarian- includes plant foods and fish
  - Semi or partial vegetarian- includes plant foods and may include chicken or fish, dairy products or eggs. It does not include red meat.

Vegan Diet

- Goal is a plant based diet
- So you could go vegan if you so desire but it is not necessary to do so.
- If animal products are eliminated from the diet vitamins and minerals to be aware of are:
  - Vitamin B12
  - Vitamin D
  - Iron
  - -Omega 3 Fatty acids
  - - Protein
  - - Calcium

Eating Problems

- Side effects of cancer and treatment can lead to:
  - Decreased appetite
  - Taste and smell changes
  - Dry mouth
  - Sore mouth and throat and trouble swallowing
  - Feeling of fullness
  - Nausea, queasiness and vomiting
  - Diarrhea and constipation
  - Increased calorie and protein needs
  - Changes in emotions (anxiety, fear, depression) that can impact our desire to eat and how we feel
- A combination of some (or all) of these symptoms = weight loss

Weight

- Goal is to stabilize weight. If you need to lose weight at all, weight loss must be gradual. **However the best time for intentional weight loss may be after treatment is complete**.
- Significant weight loss would be more than 5% in a month or 7% in 3 months

Weight

- Concern with weight loss with treatment is that, there can also be a loss of lean body mass.
- Loss of lean body mass can increase fatigue, decrease tolerance to treatment and, and result in a decrease in quality of life.
- Lean body mass can be preserved by activity and by eating adequate calories and protein.

Maximizing Calories and Protein

- Think about what could be added to foods you are able to eat that would increase calorie/protein content of the foods
- Try to purchase higher calorie and protein options at the grocery store
- Consider incorporating oral supplements, smoothies or milkshakes

Protein

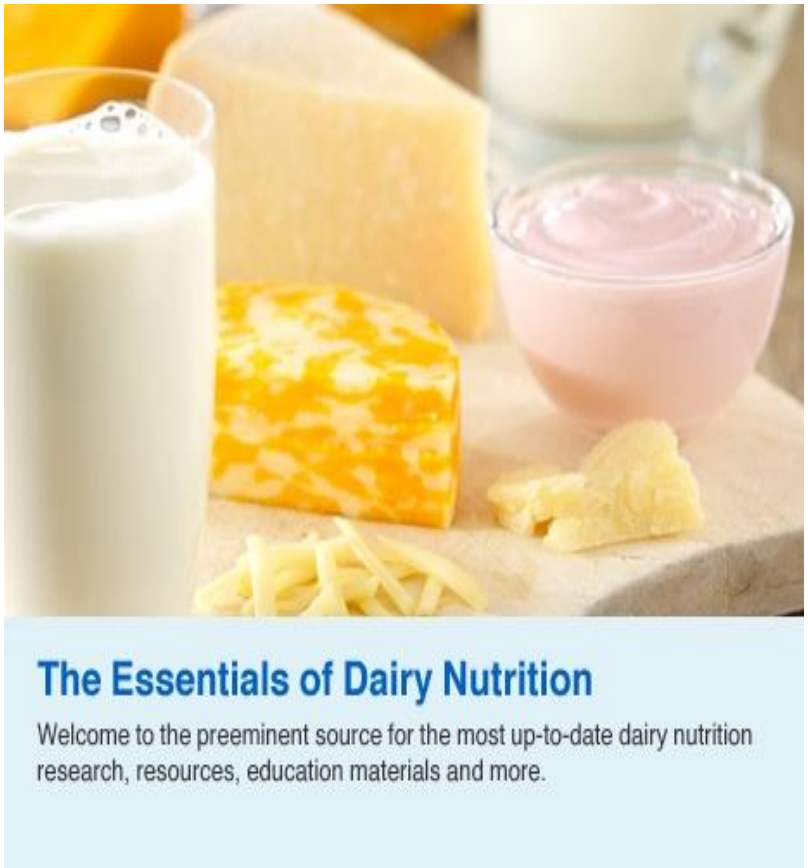
- Protein should be the main focus!
- The amount of protein you need varies from person to person as it is based on weight
- Generally, a high protein diet for women might be >80 grams per day, whereas, for men the goal may be 100 grams per day

Protein

- Animal protein has about 7 grams of protein per ounce
- Unfortunately, animal protein does not always appeal to individuals during treatment

Protein

- Often dairy products are sources of protein that are better tolerated
- 1 egg has 7 grams of protein
- ¼ cup of cottage cheese has 7 grams of protein
- 8 ounce glass of milk, lactose-free milk or soy milk has 8 grams of protein



Protein

- Other options:
  - Plant proteins- such as beans, nuts, seeds.

  -Nutritional drinks such as Boost or Ensure Plus, Carnation Breakfast Essentials, Muscle Milk, Ensure Active (Ensure Clear)

  --Protein powders

  --Meal replacement bars such as Cliff, Balance, etc.

  --Homemade milkshakes and smoothies

What can caregivers do?

- Realize that tastes can change from day to day
- Keep a variety of food within easy reach
- Encourage eating small, frequent meals and snacks (ie. every 2-3 hours)
- Offer gentle support--try not to push/force foods or get frustrated
- Try to work together to manage eating problems

Magnesium

- Medications, surgery and illness may increase magnesium losses from the body.
- Usually you will be given oral magnesium or IV magnesium to replete
- Magnesium is widely distributed in plants and animal foods
- Refined foods (ie. cereals) often fortified with magnesium

Magnesium

Recommended daily amounts of Magnesium:

Age	Men	Women
14-18	410 mg	360 mg
19-30	400 mg	310 mg
31+	420 mg	320 mg

High Magnesium Foods

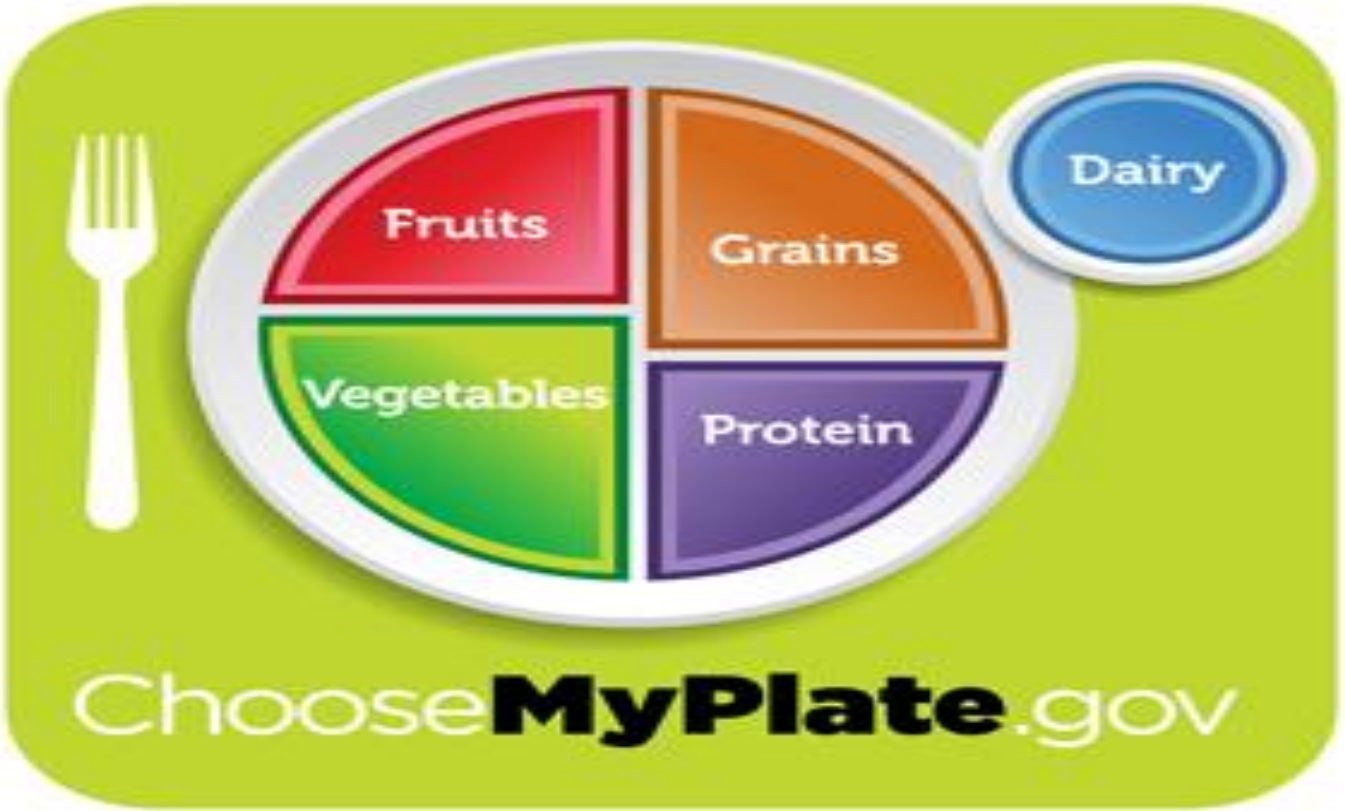
Food	Serving size	mg
All Bran Cereal	½ cup	110
Molasses	2 Tbsps.	100
Oatmeal	1 cup	61
Raisin Bran	½ cup	38
Brown Rice	½ cup	42
Avocado, Florida	1 medium	104
Spinach, boiled	½ cup	75
Pumpkin seeds	1 ounce	150
Brazil nuts	1 ounce	107
Tofu	½ cup	73
Wheat Germ	2 TBSP toasted	90
Almonds	1 ounce	80
Edamame	½ cup	50
Yogurt, plain	8 oz.	42

Diet After Treatment

Guidelines for diet after treatment

- Achieve and maintain a healthy weight
  - Calories consumed versus calories expended
- Maintain a healthy diet high in fruits and vegetables, and whole grains and low in red meat, processed meat, sugars, fats in an effort to control weight and avoid obesity
- Minimize alcohol intake-1 drink a day for women and 2 for men

Healthy Diet



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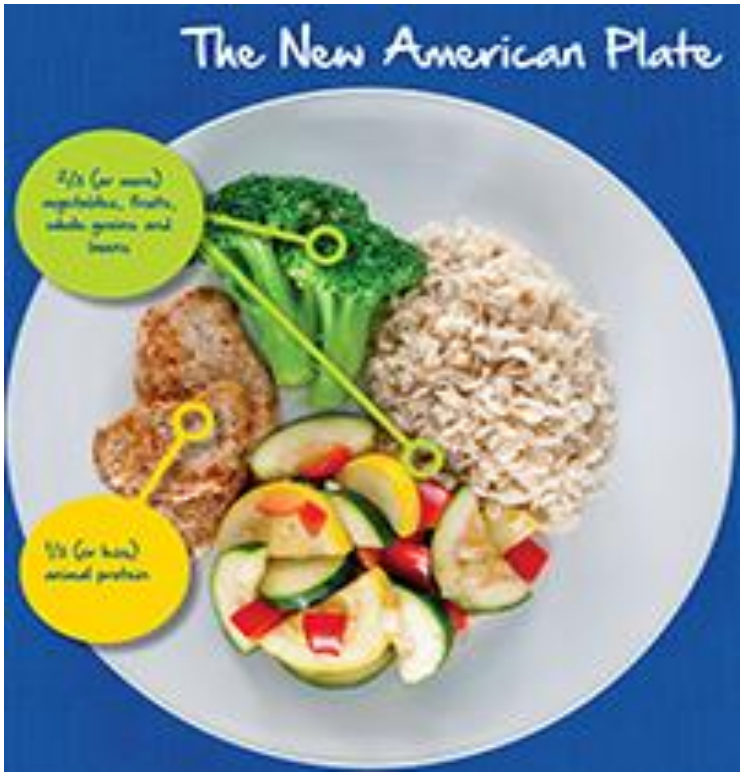


- Aim for meals made up of :
  - **2/3 (or more) vegetables, fruits whole grains or beans**
  - **1/3 (or less) animal protein**

Healthy Diet

- Focus on the “Big Picture”
- Keep diet “empowering” not a stress

Weight Changes

- Assess what your goal weight should be—regaining all the weight lost during treatment may not be desired or realistic.

- Weight gain or loss should be managed with a combination of diet, exercise and behavioral changes.

- Body Mass Index
  - Goal is for BMI to stay above ~22
  - What is the range?
  - BMI Categories:
    - Normal weight = 18.5–24.9
    - Overweight = 25–29.9
    - Obesity = BMI of 30 or greater
    - Underweight = <18.5

Weight

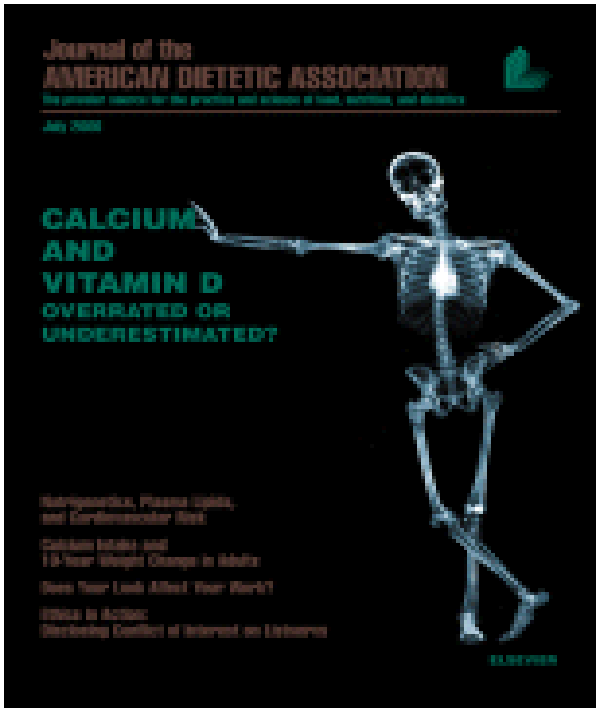
- Gaining weight following treatment may be a slow (and frustrating) process!
  - A goal of 2 to 4 pounds per month is realistic
- Remember, calorie needs may increase with fevers, infection, physical activity, GI problems or other issues.

Supplement needs along with a Healthy Diet

- After treatment the Calcium and Vitamin D may need to be supplemented
- It is not mandatory to take any additional vitamins or minerals.
- A MVI is not necessary but some find comfort in it.
- Another popular supplement is Omega-3

Calcium and Vitamin D

- Calcium and Vitamin D needs may be elevated for those on steroid therapy
- Calcium:
  - RDA for women from 19 to 50 is 1000mg per day
  - RDA for women ≥ 51 is 1200 mg per day
  - RDA for men 19 to 70 is 1000 mg per day
  - RDA for men ≥ 71 is 1200 mg
  - Tolerable upper limit is 2000 to 2500 mg per day
- Food sources of calcium include dairy products and green leafy vegetables- some products are fortified



Calcium and Vitamin D

- **Vitamin D**
  - **DRI for men and women aged 19-70 is 600 IU per day and if >70, 800 IU day**
  - **For those with Multiple Myeloma a study back in 2008 recommended intake of 1,000 IU per day of Vitamin D**
  - **Tolerable upper limit 4,000 IU per day**

- **Sources of Vitamin D include fortified milk, certain fish (salmon and tuna), egg yolks, fortified cereals and, of course, the sun.**

- **Vitamin D helps promote calcium absorption**

- **If your diet cannot or does not provide adequate amounts of calcium or Vitamin D, a supplement should be discussed with your healthcare team.**

Calcium and Vitamin D

- If deficient in Vitamin D- calcium's protective effect potentially erased
- Estimating Vitamin D intake needs to incorporate both diet sources and sunlight exposure

Vitamin D

- Sources:
  - Sun exposure ((UV)B)
  - Vitamin D containing foods

Vitamin D

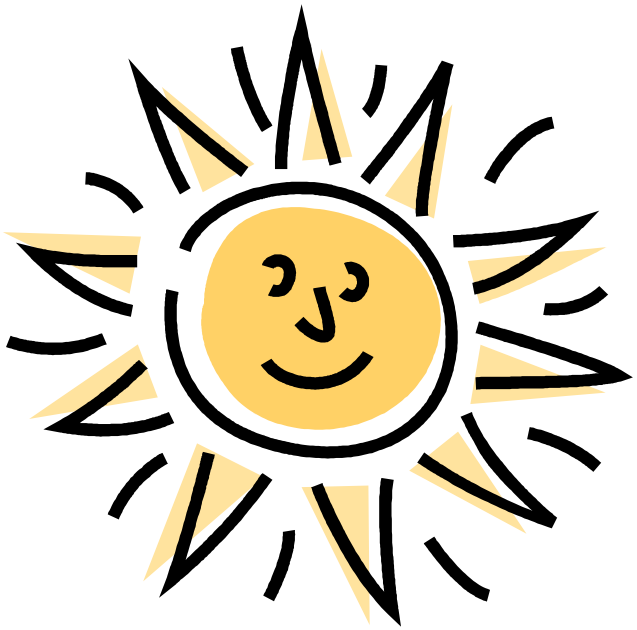
- Deficiency is prevalent.
- Signs of deficiency could be dull persistent and generalized musculoskeletal aches and pains with fatigue or decrease in muscle strength
- Never hurts to get your levels checked. It is just a simple blood test.(25(OH)D want this level 30-50nmol/L)
- Sometimes a prescription is called in for 50,000IU taken once weekly

Vitamin D

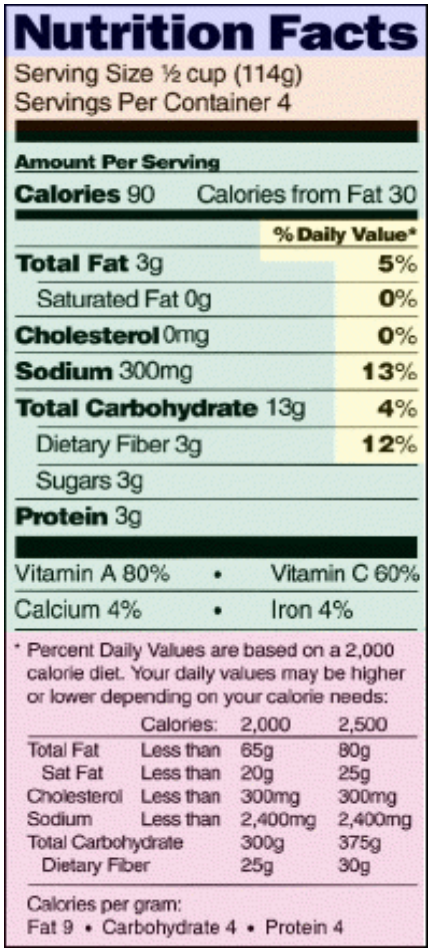
Are you in the sun?

Your body is usually able to get all the vitamin D it needs, if you regularly expose enough bare skin to the sun.

5-30 minutes of sun exposure between 10a and 3p at least 2 times per week to face, arms legs or back without sunscreen- usually lead to sufficient vitamin D synthesis.



Calcium and Vitamin D



Nutrition Facts

Serving Size ½ cup (114g)
Servings Per Container 4

Amount Per Serving	
Calories 90	Calories from Fat 30
	% Daily Value*
Total Fat 3g	**5%**
Saturated Fat 0g	**0%**
Cholesterol 0mg	**0%**
Sodium 300mg	**13%**
Total Carbohydrate 13g	**4%**
Dietary Fiber 3g	**12%**
Sugars 3g	
Protein 3g	

Vitamin A 80%	Vitamin C 60%
Calcium 4%	Iron 4%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

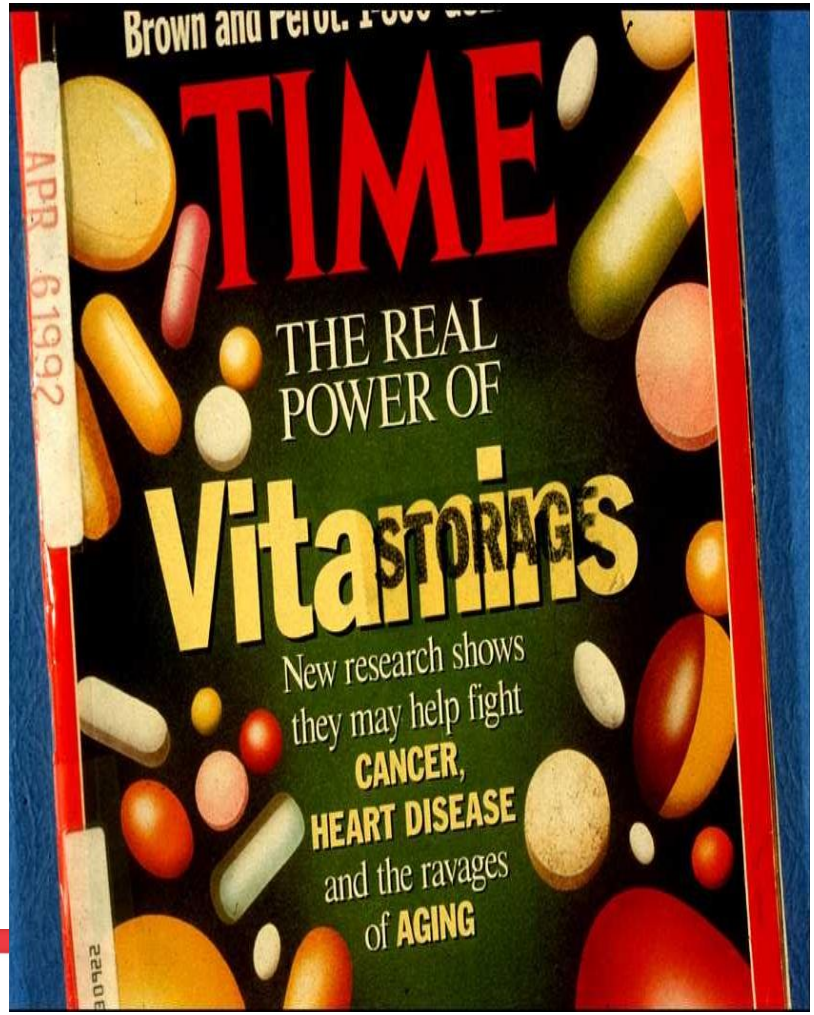
To calculate how much calcium is in this food you take the percent of calcium and add a zero. In this product a ½ cup serving provides 4% of your daily calcium need (based on 1000 milligrams per day), which is 40 milligrams.

Need for supplements?

- A general multivitamin is appropriate to take, but not mandatory
- When selecting a general multivitamin please ensure the product…
  - Contains **No Iron (if you had a transplant)**
  - Does not provide greater than 200% of the Recommended Dietary Allowance (RDA)
  - Contains **no** herbs or other plant materials

Need for supplements?

- Be cautious when taking supplements!
- Usage of supplements and herbals raises concerns for:
  - Unexpected or unwanted interactions between preparations and prescribed medicines (i.e.. Echinacea if taking immunosuppressants, St. John's Wort specifically has many interactions with other medications)
  - Potential contamination
  - No true regulatory industry- products may contain ingredients not listed on the label



Need for supplements?

- Proper nutrition can be obtained through whole foods, which often contains more nutrients than what can be found in a pill.
- If you choose to take pills/supplements please ***always*** speak with your healthcare provider.

Omega-3 Fatty Acids

- **Polyunsaturated Fatty Acids (PUFA's)**
  - **-Alpha-Linolenic Acid (ALA)**
  - **-Eicosapentaenoic Acid (EPA)**
  - **-Docosahexaenoic Acid (DHA)**
- **Mediate the anti-inflammatory response/decrease inflammation**
- **Preserve muscle mass**
- **Purported Uses of Omega 3**
  - **Atherosclerosis**
  - **Cancer prevention**
  - **Cardiovascular disease**
  - **Colitis**
  - **Cystic fibrosis**
  - **Depression**

Omega-3 Fatty Acids

- **EPA and DHA found in fatty, cold water fish, such as salmon, herring, mackerel & tuna and found in cod liver oil**

- **ALA found in plant sources such as dark, leafy greens, flaxseed, canola oil and walnuts**

Omega 3 Side Effects & Contraindications

- Side effects of capsules and oils:
  - Fishy aftertaste, loose stools and nausea after large doses
- Drug Interactions:
  - May increase the effect of anti-coagulant agents
  - FDA recommends: less than 3 gm per day as higher doses may increase the risk of bleeding

Typical recommendations is for no more than 1-2 gm per day during treatment*

Probiotics

- “Good” bacteria similar to the healthy bacteria in the digestive tract
- Helps increase stool regularity and decrease the length and severity of diarrhea
- Found in yogurt active cultures, cultured dairy products
- People with compromised immune systems should not take an over-the-counter probiotic supplements unless approved by your physician.

Gluten Free

- No connection between gluten and most cancers
- Exception: Intestinal cancers in patients who have a true gluten intolerance or Celiac's disease
- In fact, the more whole grains that are consumed, the lower risk of most cancers
- May be needlessly avoiding healthy foods that are linked with lower risk for many chronic diseases

Alkaline Diet

- Humans require a tightly controlled pH level in the body (between 7.35-7.45)—making it slightly more alkaline
- Based on the theory that suggests cancer cells thrive in an acidic environment but don't survive in an alkaline setting.
- No human studies showing that alkaline diets can help prevent or treat cancer
- Goal: 80% alkaline-forming and 20% acid-forming foods
  - Meat, fish, dairy products, caffeine, sugar and salt most acid forming
  - Fruits and vegetables most alkaline
  - Grains and legumes slightly acidic but vary by type

Bottom Line: Overall, diet is high in fruits and vegetables-- make protein choices lean and low fat

Organic

- In 1990 Standards were developed to establish uniform standards for production and handling of foods labeled organic.
- “Organic agricultural practices cannot ensure that products are completely free of residues; however, methods are used to minimize pollution from air soil and water”

Organic

- National organic program – (NOP)
  - Part of the USDA's Agriculture Marketing Service
  - Has regulatory oversight for the organic standards
- Organic food does not use conventional pesticides, fertilizers made with synthetic ingredients or sewage sludge, bioengineering or ionizing radiation

Organic

- 12 most contaminated foods:
  - Peaches
  - Apples
  - Sweet bell peppers
  - Celery
  - Nectarines
  - Strawberries
  - Cherries
  - Pears
  - Grapes (Imported)
  - Spinach
  - Lettuce
  - Potatoes

Organic

- 12 least contaminated
  - Onions
  - Avocado
  - Sweet corn (frozen)
  - Pineapples
  - Mango
  - Asparagus
  - Sweet peas (frozen)
  - Kiwi fruit
  - Bananas
  - Cabbage
  - Broccoli
  - Papaya

GMO

- Genetically Modified Foods, genetically engineered, or transgenic
- MUCH CONTROVERSARY
- No mandatory labeling in the US- but over 60 countries do.
- Currently, if it is USDA organic- GMOs are not present

GMO

- Prevalence of GMO crops:
  - 94% of soybean
  - 93% of corn
  - 96% of cotton
  - Others: alfalfa, sugar beets, canola, papaya, zucchini, yellow squash

Additional Resources

- American Institute for Cancer Research
  - www.aicr.org
- National Cancer Institute
  - www.cancer.gov
- The American Cancer Society
  - www.cancer.org
- Caring4Cancer
  - www.caring4cancer.com
- National Center for Complementary and Alternative Medicine
  - www.nccam.nih.gov
- National Institutes of Health Office of Dietary Supplements
  - www.ods.od.nih.gov
- Oncology Nutrition Practice Group of the Academy of Nutrition and Dietetics
  - www.oncologynutrition.org

Any Questions????

University Hospitals
Seidman Cancer Center

Thank You.

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