I. Color the Rainbow! Vary your vegetables! More than just vegetables!

A. Phytonutrients

1. Non-nutritive substances in plants that possess health-protective benefits

    a) Give vegetables their bright and vibrant color!

    b) Act as powerful antioxidants, decrease blood pressure and cholesterol, prevent cataracts, reduce menopause symptoms and risk for osteoporosis (regulating estrogen metabolism), and slowing or even reversing certain cancers (by detoxifying carcinogens)

    c) Enhance immune response, enhance cell-to-cell command, convert to Vitamin A (beta-carotene), repair DNA damage caused by smoking + other toxic exposures

2. An individual phytonutrients may contain many thousands of known phytochemicals, but only one or very few are present in a large amount.

    a) E.g. garlic: contains over 160 phytonutrients, when a clove is cut or crushed it produces sulfur compounds (allicin), which is responsible for its disease-fighting potential.

3. Different phytochemicals act in different ways

    a) Some have antioxidant properties (protecting against harmful cell damage), other have anticancer properties (preventing initiation and promotion of cancer), others have antiestrogen properties (blocking the action of estrogen and lowering the risk of some cancers)

        (1) They may function directly or indirectly

            (a) Directly they may inhibit enzymes that activate carcinogens or to induce enzymes that detoxify carcinogens

            (b) Indirectly they may stimulate the immune response

b) **They protect against heart disease**

(1) Some may influence blood pressure and clotting, others reduce the synthesis and absorption of cholesterol

c) **They protect your eyes**

(1) Carotenoids protect the eye against free radical damage and prevent or postpone macular degeneration, which can lead to blindness

d) **Soy**

(1) Isoflavones (most widely studied group)

(a) Heart disease, osteoporosis, cancers (prostate, breast, ovarian) menopause

4. **Phytochemicals**

a) **Beta Glucan**

(1) Oat bran, rolled oats, oat flour

(2) Reduce risk of coronary heart disease

b) **Capsaicin**

(1) Hot peppers

(2) Reduce risk of fatal clotting in heart disease

c) **Carotenoids (Beta-Carotene, Lutein and zeaxanthin, Lycopene)**

(1) BC – orange fruits and veggies

(2) Help reduce the risk of many cancers and strengthen the immune system

(a) L+Z – pumpkin, summer squash, corn, eggs, dark green leafy

(b) Reduce risk of age related eye disorders by protecting the retina from harmful UV radiation and neutralizing free radicals

(i) Ly – tomatoes, red fruits and veggies

(ii) Reduce risk of prostate and other cancers

d) **Flavonoids**

(1) Dark colored veggies – eggplant, berries, grapes, black or green tea, chocolate, red wine

(2) Act as antioxidants, decrease inflammation, reduce plaque buildup in arteries, increase HDL cholesterol, deactivate carcinogens, inhibit cancer development

e) Indoles

(1) Cruciferous veggies – broccoli, kale, cauliflower, turnip

(2) May stimulate enzymes that make the hormone estrogen less effective, possibly reducing breast cancer risk

f) Monoterpenes

(1) Citrus fruits

(2) Act as antioxidants, dispose of carcinogens

5. Optimizing your Phytochemicals

a) Supplements less effective than whole foods

(1) Some phytochemicals might not be able to metabolize alone or may not function alone

(2) Consume at least 9 servings of fruits and vegetables daily

(a) 1 serving = ½ cup fruit, 1 serving = 1 cup veggies

6. Functional foods

a) Foods that help prevent disease and promote health

b) Which foods help with what?

(1) Antioxidants

(a) Broccoli, Berries (rasp), carrots, citrus fruit, chocolate, flaxseed, grapes, honey, horseradish, tomatoes

(2) Improves GI Health

(a) Bananas, milk products, yogurt, honey, horseradish, onion family

(3) Maintains Vision

(a) Broccoli, berries (blue), carrots, corn products, eggs, leafy greens

(4) Reduces Cancer Risk

(a) Broccoli, berries, milk products, apples, beans, citrus, corn, flaxseed, garlic, grapes, teas, onion family, salmon, soy, tomatoes, whole grains

(5) Improves Heart Health

(a) *Apples, Berries, milk products, whole grains, beans, fish, flax, garlic, grapes, teas, oats, onion family, soy, walnuts*

(6) Maintains Urinary Tract Health

(a) *Berries (blueberries and cranberry)*

(7) Reduces Blood Pressure

(a) *Bananas, milk, celery, cheese, garlic, soy*

(8) Improves Bone Health

(a) *Cheese, milk products, soy*

B. Meal Ideas

1. At breakfast

a) ***Oatmeal w/ blueberries***

b) ***Whole grain dry or hot cereal with yogurt***

c) ***Soy nut butter with whole grain toast***

d) ***Soy milk with fresh pineapple or frozen berries***

e) ***Eggs!***

2. Lunch/Dinner

a) ***Tuna salad with carrots, red peppers, onions, and garlic***

b) ***Whole grain pasta with tomato sauce***

c) ***Leeks and onions with tomatoes as side dish***

d) ***Grill salmon with fresh greens***

e) ***Low fat cream of carrot, spinach, and broccoli soups***

f) ***Stir fry fresh veggies with extra garlic***

3. Snacks!

a) ***Fresh fruit***

b) ***Soy nuts, whole grain cereal, dried fruit for trail mix***

c) ***Fresh broccoli, cauliflower, and carrots raw***

d) ***Mix bananas with fresh raspberries***

Phytochemical Packed Minestrone Soup!

1 16 oz. package frozen broccoli, cauliflower, and carrot blend

2 15 oz. cans stewed tomatoes

2 14.5 oz. cans broth (beef, vegetable, or poultry)

1 15 oz. can great northern beans

2 oz. uncooked whole wheat vermicelli (break into two inch pieces)

Grated Parmesan Cheese

Directions: In a large saucepan, combine vegetables, tomatoes, broth, beans, and pasta and bring to a boil. Reduce heat, cover, and simmer for 6 to 8 minutes or until vegetables and pasta are tender

Sprinkle with Parmesan cheese.

Makes 4 to 6 servings

1.5 cup = 210 calories, 2 grams of fat.