Session 5: Choosing Functional Foods

Course: Nutrition and You: Functional Foods
Objectives
Students will be able to:

1. Understand the potential health benefits and possible risks of plant sterols.
2. Be able to state how to boost the phytochemical content of the diet.
3. State how to increase functional food benefits when snacking.
4. List the phytochemical benefits of whole grains.
5. Be able to provide guidelines on how to choose functional foods.
6. Provide functional food meal ideas.
Outline

- Plant Sterols, Phytosterols and Phytostanols
- Whole Grains
- Omega 3
- Choosing Functional Foods
- Meal and Snack Ideas
  - Boosting Phytochemical Content of Diet
Plant Sterols, Phytosterols, and Phytostanols
Plant Sterols: an Introduction

- Phytosterols is another name for plant sterols.

- Just as cholesterol is an integral component of the structure of cells in the human body, plant sterols perform the same role in plants.

- Sterols are structurally similar to cholesterol molecules.

- Sterols occur naturally in the diet, but the amount being advocated in functional foods is around 100 times the average intake from ‘normal foods.’

- Plant sterols can be found in functional juice, margarine, salad dressing, cheese and yogurt.
Phytosterols and Phytostanols (Plant sterols or Stanols)

- Cholesterol-lowering additive: Margarine, fruit juice, bread, dietary supplements.

- “These substances are minor components of membranes in many nuts, seeds, vegetable oils, fruits, vegetables and other foods. They are chemically related to cholesterol. They are more easily incorporated into foods (other than fruit juices) when they are converted to ester forms. Then, when consumed in high doses from foods or dietary supplements, the sterol or stanol esters reduce the absorption of cholesterol from food and can lower LDL (“bad”) blood cholesterol levels by 10 to 15 percent. They are not toxic, but they may reduce the body's absorption of nutrients called carotenoids that are thought to reduce the risk of cancer and heart disease.”

Per cspinet.org chemical cuisine accessed April 19, 2015
Plant Sterols: an Introduction

- Their benefits stem from their ability to block the absorption of cholesterol from the gut into the blood stream.
- They block absorption of the cholesterol in foods and also block the re-absorption of cholesterol in the bile from the liver.
- The cholesterol levels in your blood that, if elevated, are a risk factor for heart disease, depend very little on the amount of cholesterol you eat.
- Managing the amount of cholesterol re-absorbed in the gut is key to managing cholesterol levels.
Plant Sterols

- Endorsed: National Cholesterol Education Program.
- Science suggests cholesterol levels lowered 5-15% in several weeks with no side effects.
  - Example Chol: 225→192, 2-3 weeks.
  - Eating two servings a day gives a total of 1.3g of plant sterols along with diet low in saturated fat and cholesterol.
If You Have High Cholesterol: Some experts advise trying these products and diet modifications prior to medication – weigh the evidence and risk and decide.

If you are on statins, tell your doctor before beginning a regimen with plant sterol products.

Choose products with sustainable palm.
Phytosterols and Phytostanols

- Numerous other controlled trials have since confirmed the cholesterol-lowering effects of stanols or unsaturated phytosterols using a variety of age groups and both sexes.

- Including these in concentrated forms in the diet can have a positive effect on people with elevated cholesterol levels.

Phytosterols
How Much?

According to the Academy of Nutrition and Dietetics:

“daily consumption of 2 - 3 g (through margarine, lowfat yogurt, orange juice, breads, and cereals) lowers TC concentrations in a dose dependent manner by 4 – 11% and LDL cholesterol concentrations by 7 – 15% without changing HDL cholesterol or triacylglycerol concentrations”

Phytosterols
How Much?

- Amounts greater than recommended have no additional benefit.
- For maximum effect, eat plant sterols with other foods.
- Plant sterols contain calories which if eaten in excess will cause weight gain. Substitute them for other foods.
- Individuals taking statins can achieve further reduction by eating phytosterols as part of a healthy diet, but discuss plans with your doctor.
- Individuals with financial limitations may find these products expensive.
Phytosterols

Risks

- There are a few people with rare genetic defects who are vulnerable to high phytosterol intakes (called phytosterolemia)
  - This could worsen plaque formation
- Again: Time will tell if supplement benefits outweigh the risks
- The impact of stanols on this group of people is unknown
- It is not established whether the larger number of people who are heterozygous for such conditions may also have some increased susceptibility to large phytosterol intakes
Phytosterols

Risks

- Some individuals may consume large amounts or multiple types of phytosterol fortified products, such as butter-like spread and supplements. These could cause harm.

- *It is likely that these artificially elevated levels of consumption over the whole of the human life-span potentially could have adverse effects either for people in general or for some specific subgroup(s) of the population that may be effected by medication or genetics.*

- Generally not recommended for children under five, pregnant or nursing women. Decreasing blood cholesterol is not normally recommended for these groups.

Whole Grains
Whole Grains

- Whole wheat
- Whole oats
- Whole grain corn
- Brown rice
- Whole rye
- Whole grain barley
- Amaranth
- Farro/ Emmer

- Grano
- Wild rice
- Buckwheat
- Triticale
- Bulgar (cracked wheat)
- Millet
- Quinoa
- Sorghum
- Spelt
- Wheatberries

Check off the whole grains you eat at least once a week
Whole Grains: Health Benefits

- Reduced risk of heart disease, certain types of cancer, type 2 diabetes and help in weight management

- 2010 Dietary Guidelines suggest that at least half of your grains be whole grain every day
  - Most Americans currently eat less than a single serving of whole grains daily

- Whole grains are not just about fiber!
  - Nutrients, fiber, and phytochemicals make whole grains a complete package that cannot be replaced by natural or synthetic fiber from other sources.
  - For example, brown rice has almost 10 times as much phosphorus and potassium as white rice
  - Check out the USDA’s core nutrition messages for whole grains: http://www.fns.usda.gov/core-nutrition/core-nutrition-messages
Whole Grains: Health Benefits

- Contain fiber, provide vitamins, minerals, phytonutrients, antioxidants and beneficial enzyme inhibitors.

- Whole grains deliver as many phytochemicals and antioxidants as fruit & vegetables but often different types of phytochemicals.

- Read labels and compare and contrast different brands and varieties of whole grains for fiber content.
Whole Grains: Health Benefits

- Grain foods with more than 4 grams of fiber usually contain an isolated fiber source, such as bran, and may not be considered whole grain.

- Whole grains are the entire seed, known as the kernel, which is made up of 3 key parts: the bran, the germ and the endosperm.

- Whole grains may be eaten whole, cracked, split, flaked or ground and then used in breads, cereals, pasta and crackers.
Whole grains

- Refined grains have most of the bran and some of the germ removed.
  - Causes loss of fiber, B vitamins, vitamin E, trace minerals and unsaturated fat and 75% of the phytonutrients are decreased.

- Refined grains are enriched with vitamins and minerals which are in different forms than the vitamins and minerals we get through foods. These vitamins and minerals are may not be as bioavailable.

- Whole grains make up only about 10 to 15% of grains on supermarket shelves.
Tips on Finding Whole Grains

- The ingredient statement will list “whole wheat flour,” or “whole oats”.
  - Look for this to be the first ingredient.

- Another good way is to look for whole grain stamps from Whole Grains Council.

- Some descriptive words such as stone ground, multi-grain, 100% wheat, or “contains whole grain” do not necessarily indicate the product is 100% whole grain.

- The color of the product does not signal whole grain. Bread is often brown because molasses has been added.

- For more on whole grains see: http://wholegrainscouncil.org/
The FDA allows the following claim for whole grain products:

- "Diets rich in whole grain foods and other plant foods and low in total fat, saturated fat, and cholesterol may reduce the risk of heart disease and some cancers."
- Or “Diets rich in whole grain foods and other plant foods and low in total fat, saturated fat, and cholesterol may help reduce the risk of heart disease.”

The food product must meet these criteria:

- Contain all portions of the grain kernel
- Contain at least 51% whole grain by weight
- Meet specified levels for fat, cholesterol and sodium
Whole Grains

- When working with kids and families check out the Healthy Kids Today, Prevent Cancer Tomorrow campaign, Whole Grain Tool Kit at
  - [www.superkidsnutrition.com/healthykids](http://www.superkidsnutrition.com/healthykids)
  - Or [www.aicr.org/healthykids](http://www.aicr.org/healthykids)

### Examples of Whole Grains

- Whole-Wheat Bread
- Oats
- Quinoa
- Brown, Red or Purple Rice
- Whole-Grain Pasta
- Popcorn

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Color in a shield each time you eat a whole grain this week. See how many you can eat each day!
Omega-3s and Omega-6s
The Fatty Acid Balancing Act

- Omega-3 and Omega-6 are names of polyunsaturated fatty acids (PUFAs) we eat that both have important roles in the body.

- Americans tend to eat far more Omega-6 fatty acids, present in vegetable oils added to processed foods, rather than a healthy balance between the two.

- A dietary imbalance between the two fatty acids, as seen in the typical American diet, is associated with chronic disease such as cardiovascular disease and autoimmune disorders.
The Fatty Acid Balancing Act

- Omega-6 fatty acids are used to make prostaglandins which promote inflammation, a normal physiological response to injury.

- Omega-3 fatty acids, such as EPA and DHA, can control the inflammation caused by prostaglandins.

- If the diet is deficient in Omega-3 fatty acids, there is no check and balance for inflammation.

- For a good review article see: http://rheumatoidarthritis.net/nutrition/real-deal-omega-3-omega-6/
The Fatty Acid Balancing Act

- Balance your intake of the PUFAs!
- Limit sources of Omega-6s that Americans typically eat in excess: beef, poultry, safflower oil, sunflower oil, corn oil, and processed foods.
- Increase dietary sources of Omega-3s: specifically fatty fish.
  - There are plant sources of Omega-3s, such as seeds and nuts, but they are not converted as efficiently in the body to the kinds of fat that provide inflammatory protection.
Replacing saturated fats with omega-3 fats combined with a low fat diet may help with the following conditions:

- Chronic Obstructive Pulmonary Disease
- High cholesterol
- Angina
- High blood pressure
- Rheumatoid arthritis
- Psoriasis and eczema
Fatty Fish

- In addition to the benefits already discussed, DHA and EPA are likely protective against vascular disease, which is one of the major causes of age-related dementia.
  - These fatty acids protect neurons and synapses.

- DHA’s neuroprotective effects may also be relevant to cognitive decline in normal aging.

- Eat fatty fish twice a week!

- If you take supplements, beware that having more than 3,000mg can increase bleeding time – always check with your primary care physician before taking supplements.

- This is extensively discussed in New in Nutrition Wellness!
Sardines

- Sardines are a great source of omega-3 fatty acids:
  - The bones are edible and high in calcium: 325 mg of calcium in 3oz.
  - They’re low in mercury, making them safe to eat 3-4 times a week.
  - Currently considered to be an environmentally sustainable choice.
  - The best choice are those packed in water without salt.
  - Of course you have to like the taste.
Other Fatty Fish:

- Salmon: 3,650 mg
- Lake trout: 1,600 to 1,900 mg
- White Albacore tuna canned: 480 mg
- Pacific Cod: 470 mg
- Sardines in tomato sauce: 1,190 mg
- Swordfish: 1,390 mg

Based on mg of DHA and EPA per 6 oz
How to Eat More Omega-3s:

- Eat fish 2-3 times per week with lots of green vegetables. Fish is a good source of protein without nearly as much saturated fat as is found in meats.

- Add walnuts or soybeans to vegetable salads.

- Mix hummus and mayo together with canned salmon or tuna.

- Replace oil in your home with olive oil or organic canola oil (canola is often GMO, which is why I’m recommending organic); buy in small quantities so it doesn’t become oxidized.

- Flaxseeds or flax meal can complement many foods with its nutty taste. Pour over salads, brown rice, cereal, yogurt, or use in casseroles.

- Boost your walnut intake. Even pumpkin seeds have small amounts of omega-3’s.
More Functional Foods!
Nutrient Dense Foods

- Barley: Soluble fiber, copper, manganese, selenium
- Beans: Protein, soluble fiber, antioxidants, folate, copper, iron, potassium, zinc
- Nuts: Phytosterols, monounsaturated fats, omega-3 fats (walnuts), calcium (almonds), selenium (Brazil nuts)
- Seeds: Phytosterols, vitamin E, calcium (sesame seeds), selenium (sunflower seeds)
Eat This!

- Lima beans, soybeans, sesame seeds and bran may combine with dietary minerals to decrease production of free radicals (contain inositol).

- Whole grains, legumes, and seeds [which] appear to block the process that turns cells cancerous (compounds called protease inhibitors).

- Whole grains are good sources of potassium, antioxidants, phytoestrogens, and fiber.
Walnuts, rich in omega 3 fatty acids and monounsaturated fats, may carry this qualified health claim:

“Supportive but not conclusive research shows that eating 1.5 ounces per day of walnuts, as part of a low-saturated fat and low cholesterol diet, and not resulting in increased caloric intake may reduce the risk of coronary heart disease.”

Add walnuts to salads, cereal, yogurt, brown rice, or as a snack with low fat cheese- aim for 6 walnut halves a day
Walnuts and Cancer Prevention

- You may think “heart and brain health” when you think of walnuts, but some animal studies show that walnuts may slow or prevent growth of some cancers.

- Tasty ways to use walnuts:
  - Crush them into whole grain banana pancakes
  - Add to oatmeal or homemade granola
  - Make your own walnut butter.
  - Add to muffins or smoothies
  - Try walnut pesto

Almonds:

- High in potassium and unsaturated fats, low in saturated fat
- Recent research: antioxidant synergy between flavonoids and vitamin E found in almonds
- Contains: riboflavin, magnesium, and zinc
Flaxseed

- Contains lignan, a phytoestrogen that may help prevent breast cancer.

- Try including 3-5 tablespoons of flax meal (ground seeds) a week in your diet. Add to cereal, yogurt, baked goods, breaded chicken and much more.

- Flaxseed is not recommended during pregnancy.

- More research is needed to find out if flaxseed interacts with the breast cancer drug tamoxifen.

  - Although there is no conclusive evidence yet, women using tamoxifen may want to limit ground flaxseed to 1 tablespoon a day.

  - Per AICR.org: In animal studies, flaxseed did not interfere with tamoxifen’s actions and may have enhanced effectiveness. However, with no results of clinical trials of flaxseed use during tamoxifen or aromatase inhibitor treatment, decision
Beans

- People who eat a variety of beans tend to have lower body weight, smaller waist circumference and less risk of obesity.

- Beans are a very rich source of natural antioxidant compounds and fiber. The darker the bean the richer the antioxidants. They are also an excellent source of folate and iron.

  - Serving Suggestions: Top off salads with black beans or pinto beans. Add white cannellini beans to pasta sauce.
  - Rinse canned beans to reduce sodium and retain the minerals.
  - Great bean ideas to boost plant proteins:

Choosing Functional Foods
Choosing Functional Foods

To Summarize…

- Pick functional whole foods rather than highly processed products to incorporate into your diet.
- Follow recommended dietary guidelines for conditions like high cholesterol or diabetes.
- Read labels carefully to find the source of added ingredients, such as fiber.
- Work with a Registered Dietitian Nutritionist (RDN) to customize your diet.
- As a healthcare provider: set an example by achieving balance and moderation and functional foods in your diet.
Fill Half Your Plate With Fruit and Vegetables!
Maintaining or Achieving Good Health

“Fitness is only half the equation”

To keep young, protect your heart & body, and help your memory & mental health, work towards:

- Controlling blood pressure, cholesterol and blood sugar
- Eating a healthful diet including functional foods
- Finding a way to connect with people and the world around you 😊
THINK ABOUT YOUR GOALS

Stop: Drinking sweetened beverages

Start: Taking the stairs if it’s < 5 flights

Keep: Bringing a water bottle to work

- Use this activity with clients or with yourself. It’s a great way to summarize new concepts learned and put them into practice.
- List a goal that you plan to start, a habit you plan to stop, and something you want to keep doing.
- Re-evaluate each week.
You are what you eat – down to each little cell in your body
To Recap: Be Cautious and Careful

- Many of the functional foods haven’t been tested for safety — stick to the ones discussed in the lecture or consume the whole unprocessed food.

- Check with your doctor and/or a Registered Dietitian Nutritionist who is educated/well versed in supplements if you’re considering taking any.
To Recap: Be Cautious and Careful

- **Too much** of a particular herb or supplement can be harmful, and even interfere with medicines, leading to serious side effects.

- Functional foods are not magic bullets; they do not replace a healthy, well-balanced diet.
To Recap: Be Cautious and Careful

- Not all functional foods are necessarily good for us. Choose wisely.

- Bottled iced tea that contains certain herbs
  - Check for sugar
  - Herbs aren’t regulated – may not be safe
  - Remember there are NO regulations for herbs and other supplements, such as amino acids
  - Majority of fortified functional foods have not been tested for safety
Meal and Snack Ideas
Breakfast Ideas with Functional Foods

- Oatmeal or whole-grain cereals with low-fat milk
- Quinoa with dried cranberries, chopped walnuts and chopped oranges
- Bran muffins made with whole grains
- Whole-grain waffles or pancakes – try the kind with a blend of different whole grains topped with flax meal
- Fresh or frozen microwaved fruit with almonds
- Plain low fat kefir milk or a plain low fat yogurt smoothie with frozen wild blueberries and frozen mango
- Yogurt with frozen berries and cinnamon
- Omega-3 fortified scrambled eggs with spinach and roasted tomato
Lunch Ideas with Functional Foods

- Slice of whole grain bread with lentil soup (yellow, brown, green or red) or vegetarian chili
- Purslane, a mild, sweet-sour flavor and a chewy texture. It’s a type of salad mix which contains some omega 3 fatty acids, and is popular in Italy.
- Top off your salad with pinto beans or kidney beans, chopped raw onion and garlic, grated carotenoid rich carrots.
- Roasted red tomatoes sliced with basil and one thin slice of mozzarella cheese
- Sardines on toast
- Organic chicken chopped in couscous with walnuts
Choose fresh fruit and a small handful of seeds or nuts, or try spreading a small amount of all natural peanut butter on an apple or a banana.

Low-fat or nonfat plain or Greek yogurt, whole-grain crackers (seek Melissa’s Healthy Living cracker article) with avocado slices, fruit, veggies, hummus and baked blue corn chips.

Whole wheat couscous, millet with chopped low-fat cheese, fruit and nuts.

Edamame.

Baked sweet potato with cinnamon and phytosterol spread.
Snack Attack: Functional Foods

- Bananas contain magnesium which protects against bone loss and is associated with heart health, and are also packed with potassium, which helps lower blood pressure and reduces the risk of kidney stones and bone loss.

- Try whipping up Banana Whip
  - Peel and freeze ripe bananas – put in food processor or blender with a tablespoon of yogurt or teaspoon of juice for easy blending.
  - Optional ingredients: cinnamon & vanilla extract
  - Tastes like frozen yogurt
Meal Ideas

- Be smart at supper by substituting brown rice, quinoa, or another whole grain for white rice.
  - However, it’s recommend to limit brown rice to 1 1/2 to 2 cups per week because of the arsenic content until we get a formal recommendation. California rice seems to be lower in arsenic.

- Just because it’s a functional food doesn’t mean you have free reign on how much you eat.
  - Keep portions in check: use the ChooseMyPlate.gov guidelines!

- For dessert, fresh fruit is the best choice, although canned fruit in juice is also good.

- Heated frozen fruit is also delicious, like frozen cherries!
To Recap…. 

Fruits and vegetables:

- All colored fresh fruits and vegetables offer health-promoting phytochemicals
- Choose a variety of colors in your diet
- Choose plain frozen fruits and vegetables. The freezing process helps retain nutrients
- Choose canned fruit packed in water or its own juice rather than in syrup
Food Tips

- Acorn squash: lycopene, folate, and vitamins A and C, rich in potassium - almost 900 milligrams/cup.
  - Buy it frozen and keep it simple
  - Roast in the oven or microwave and serve with cinnamon and a little brown sugar – delicious!

- Butternut squash also contains many nutrients and is sometimes sold chopped and ready to steam.
  - Try cooking topped w/apples or cinnamon
  - Or steam cook, cool and add to your fruit smoothies
I don't have a microwave so I don't know! Can you really microwave an acorn squash?
Molly, 4/24/2014
Tips on Boosting the Phytochemical Content of Your Diet

- Add vegetables to rice, omelets, potato salad, pastas. Use broccoli/cauliflower florets, mushrooms, peas, carrots, corn or peppers. Try making egg frittatas with veggies and skim milk in muffin pans.

- Supplement a quick-fix boxed grain side dish like Moroccan rice or tabouleh with fresh herbs and vegetables

- When you want sweets try fruit filled cookies, canned fruit on top of puddings, oatmeal with maple syrup and fresh berries or banana whip

- Add raisins, grapes, apple chunks, pineapple to carrot or coleslaw – try cranberry tuna salad or chicken salad with fruit
Key Messages

- Incorporate more functional foods into your diet but in moderation.
- Don’t start drowning your food in smart balance or benecol.
- Spice it up in generally recognized as safe amounts, such as the $\frac{1}{2}$ tsp of cinnamon a day discussed in week 2.
Key Messages

- Be adventurous - experiment with one or two new foods every week.

- Try planning out 5 meals prior to going grocery shopping – with some new ideas discussed in the last few weeks of lectures.

- Make out a shopping list to make sure that you have everything on hand while you do the cooking.

- For healthcare providers, what new messages will you carefully convey to your clients?
+ **Websites**

- [www.ific.org](http://www.ific.org) contains more information on functional foods and handouts on a variety of topics, reliable researched-based information for both healthcare professionals and consumers

- [http://www.foodnavigator.com](http://www.foodnavigator.com)

- [http://www.aicr.org/site/PageServer](http://www.aicr.org/site/PageServer) - sign up for a free weekly recipe

- Visit my sites and sign up for my GUIDES for up-to-date healthy living tips:
  - [http://melissashealthyliving.com/](http://melissashealthyliving.com/)
Nutrition research is ever expanding. Each day new discoveries are made, and with the future heading towards nutrition genomics, this field is still in its infancy.

The end ... or just the beginning
Thank You!!