Functional Foods, Phytochemicals, and Fortified/Enriched Foods

NUTR 207 2020: Module 1 Chap.2

mary.hendrickson@mcgill.ca

Functional Foods

"Any modified food or food ingredients that may provide a health benefit beyond the traditional nutrients it contains"

National Academy of Sciences' Food and Nutrition Board, 1994

"Group of foods known to posses nutrient or non-nutrients that might lend protection against diseases"

Nelson Education, 2021

Hasler, 2002

Functional Foods
Examples

Food	Bioactive component	Proposed health benefit
Fatty fish	Omega-3 fatty acids	Reduces heart disease and myocardial infarctions
Garlic	Organosulfur compounds -E.g. allicin	Reduces total and LDL cholesterol
Tomatoes	Lycopene	Reduces risk of prostate cancer
Whole oat products	Beta-glucan	Reduces total and LDL cholesterol
Green tea	Polyphenols (catechins)	Reduces cancer risk

Hasler, 2002

Functional Foods
Characteristics

- Can be of plant or animal origins
- Functional foods may have characteristics similar to drugs
- The quantity of functional food needed and length of time to see beneficial effects varies by functional food

Phytochemicals

Phyto means plant in Greek

- Phytochemicals are non-nutrient components of plants
- They are biologically active and believed to be protective against disease

Emerging as potential regulators of health

- Antioxidants (more details in future classes…)
- Regular protein synthesis
- Mimic hormones
- Alter blood chemistry

Phytochemicals Examples

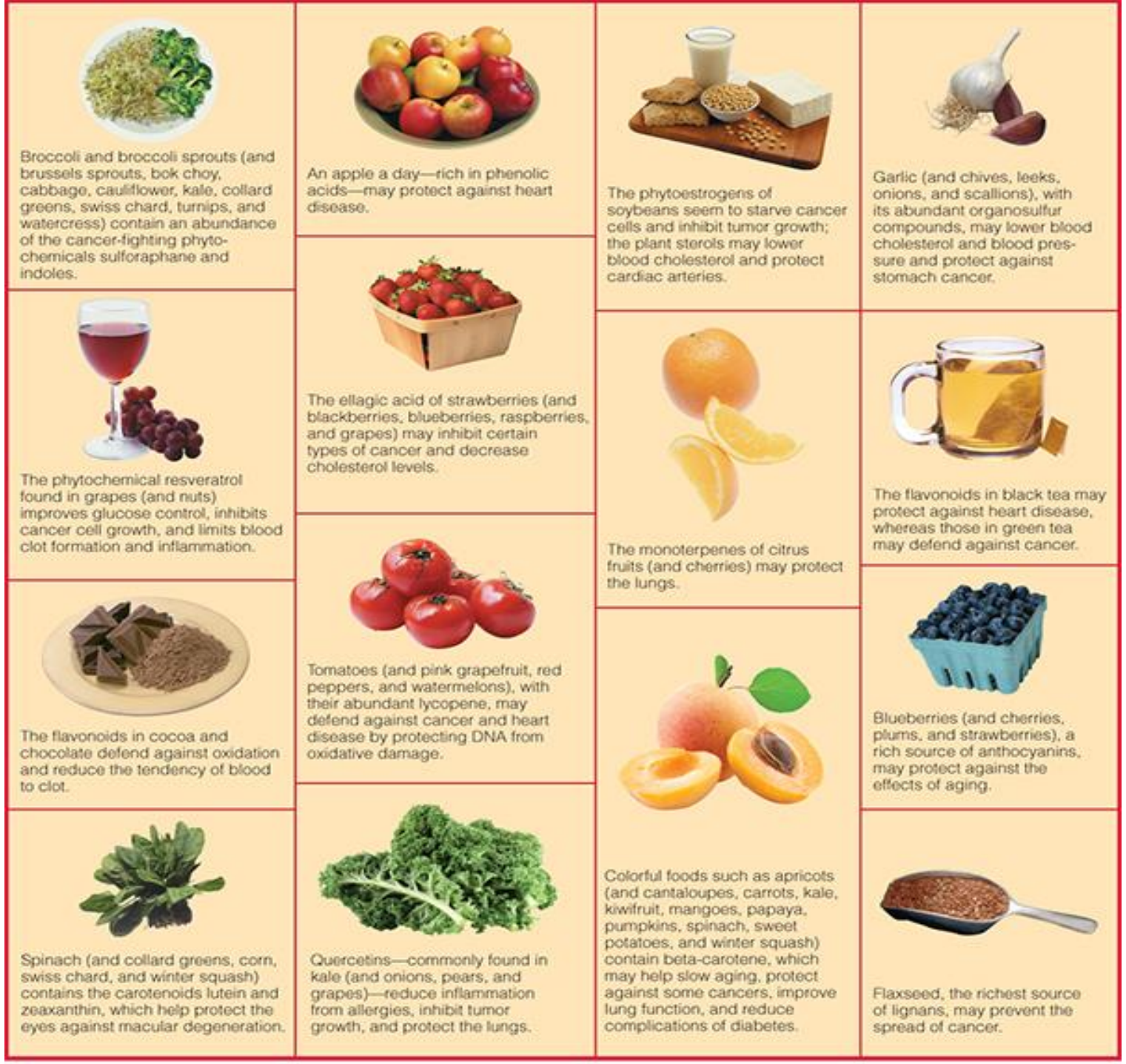


Figure H13-1

Phytochemicals Examples

Colorful Fruits, Vegetables, and Phytochemicals		
Color	**Phytochemicals**	**Fruits and Vegetables**
White and green	Allyl sulphides	Onions, garlic, chives, leeks
Green	Sulforaphanes, indoles	Broccoli, Brussels sprouts, cabbage, cauliflower
Yellow and green	Lutein, zeaxanthin	Asparagus, collard greens, spinach, winter squash
Orange and yellow	Cryptoxanthin, flavonoids	Cantaloupe, nectarines, oranges, papaya, peaches
Orange	Alpha and beta carotenes	Carrots, mangos, pumpkin
Red and purple	Anthocyanins, polyphenols	Berries, grapes, plums
Red	Lycopene	Tomatoes, pink grapefruit, watermelon

Phytochemicals

Should phytochemicals be taken in a pill/ supplemental form?

- Many claims… but limited scientific research and insufficient evidence
- Supplements are in much higher forms that found in food and can have adverse interactions and may contain untested ingredients

Natural Health Product (NHP)

NHP: as defined by Health Canada

- **Natural and Non-prescription Health Products Directorate**
- www.canada.ca/en/health-canada/services/drugs-health-products/natural-non-prescription.html
- **'Under the Natural Health Products Regulations, which came into effect on January 1, 2004, natural health products (NHPs) are defined as:**
  - Probiotics
  - Herbal remedies
  - Vitamins and minerals
  - Homeopathic medicines
  - Traditional medicines such as traditional Chinese medicines
  - Other products like amino acids and essential fatty acids
  - NHPs must be safe to use as over-the-counter products and do not need a prescription to be sold. Products needing a prescription are regulated as drugs under the Food and Drug Regulations.'

Fortified Foods or Enriched Foods

”Foods to which nutrients have been added”

Nelson Education, 2021

Fortified Foods
Examples

Milk
-Vitamin D

Orange juice
-Vitamin D, Calcium

Wheat Flour
-Thiamin (B1), Riboflavin (B2), Niacin (B3), Folic acid, Iron

Summary of Definitions

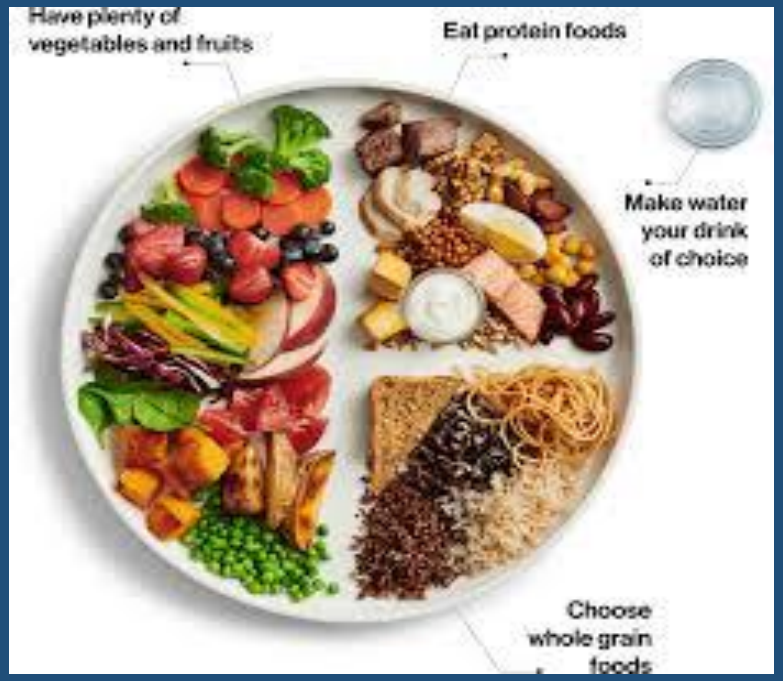
Food Type	Definition
Functional Food	Any food that has benefits beyond nutrients, notably disease prevention
Phytochemical	Non-nutrient components of plants that are biologically active and believed to be protective against disease
Fortified/ Enriched Foods	Foods to which nutrients have been added

Some fortified/ enriched foods are considered functional foods

E.g. Milk is fortified with Vitamin D, which prevents rickets disease

Some functional foods CONTAIN phytochemicals

Phytochemicals, functional foods Safety



Are there concerns about Phytochemical and functional foods? Consider:

- Does it work?
- Is it safe?
- Has Health Canada issued a warning/ advisory?
- How much do I really need?
- Does it meet the current nutrition guidelines?
- How much does it cost?
- Who is selling it to me and why?

- **Bottom line: Eat a variety of colorful fruits and veggies…Balance your plate!**

References

- Hasler, C. M. (2002). Functional foods: benefits, concerns and challenges—a position paper from the American Council on Science and Health. *The Journal of nutrition*, *132*(12), 3772-3781.
- Frances Sizer, Ellie Whitney, Leonard Piché. (2021).Nutrition: Concepts and Controversies, 5th, 64-72.
- https://www.canada.ca/en/health-canada/services/drugs-health-products/natural-non-prescription.html accessed Aug. 24, 2020.
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