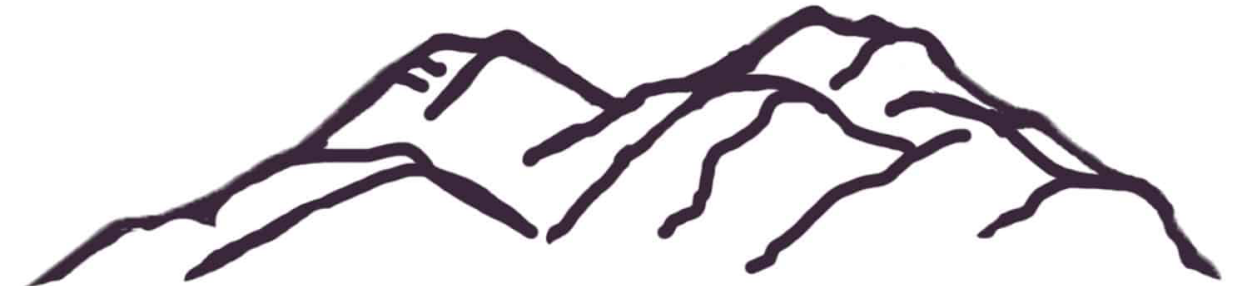




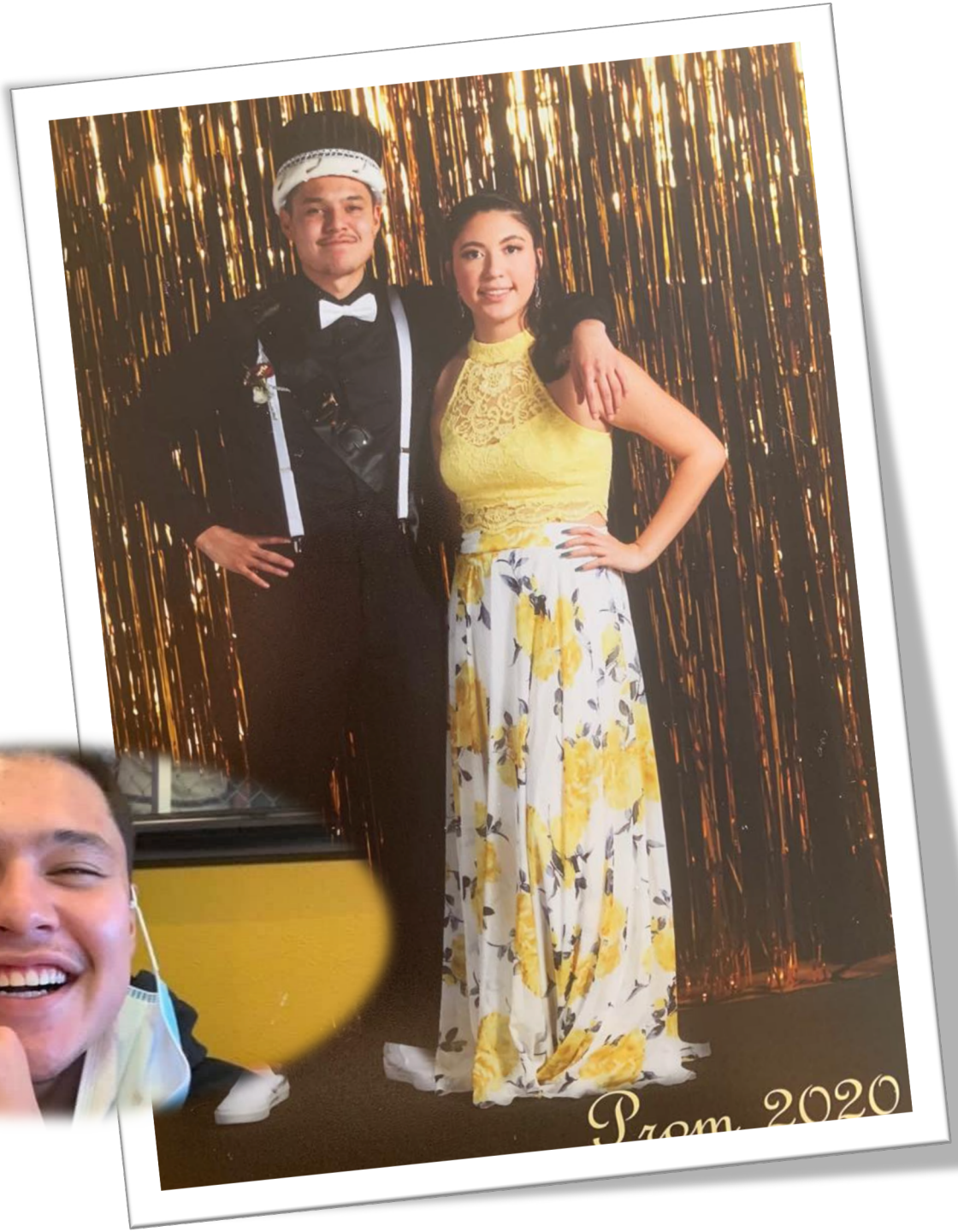
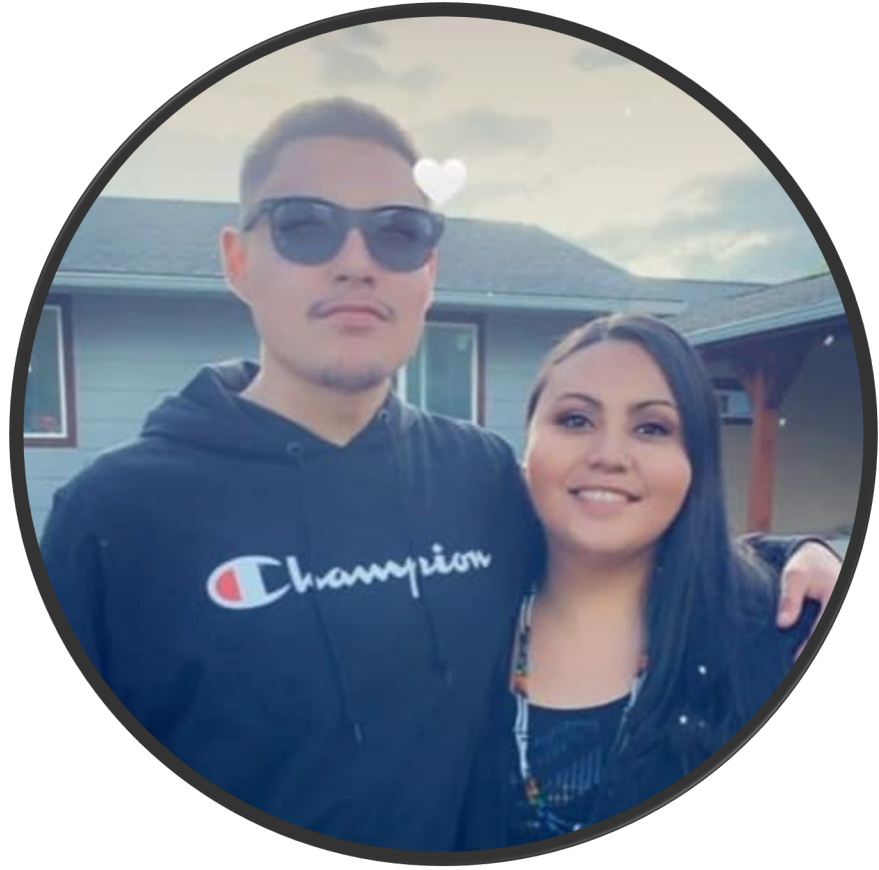
**SALISH KOOTENAI
COLLEGE**



MSU FOOD & HEALTH LAB



SAUL BLACK WEASEL
YOU WILL NEVER BE
FORGOTTEN!





<https://www.food-management.com/blog/foodservice-medicine>

ADVANCING HEALTHY AND SUSTAINABLE DIETS FOR ALL

LESSON 7: FOOD AS MEDICINE

FIRST

Proteins



Water



Minerals

Healthy Source
of Six
Essential Nutrients



Carbohydrates



Fats

Vitamins



SECOND

- V** • Vital role in natural wear and tear of the body
- I** • Improves heart health
- T** • Two types: water and fat soluble
- A** • Aids in digestion
- M** • Maintain skin, hair, teeth, bone, and vision
- I** • Improve nervous system function
- N** • Normal growth and development
- S** • Supply energy throughout the body

THIRD

THE 12 MOST NUTRIENT DENSE FOOD IN THE WORLD



LIVER



STEAK



AVOCADO



SARDINES



CACAO



SEAWEED



WILD SALMON



MUSHROOMS



EGGS



SPINACH



OYSTERS



ALMONDS



CAN ANYONE REMEMBER THE TWO CATEGORIES?

ACCORDING TO THE US DIETARY GUIDELINES, AMERICANS EAT TOO MUCH FOOD ON THE LEFT AND NOT ENOUGH ON THE RIGHT.

Foods high in macronutrients
(carbohydrates, lipids, fats)



This Photo by Unknown Author is licensed under [CC BY-SA-NC](#)

Foods high in micronutrients (vitamins and minerals)



This Photo by Unknown Author is licensed under [CC BY](#)

MACRONUTRIENTS



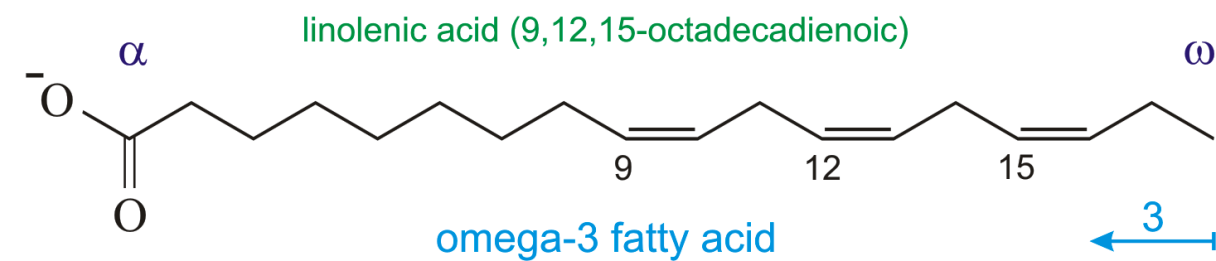
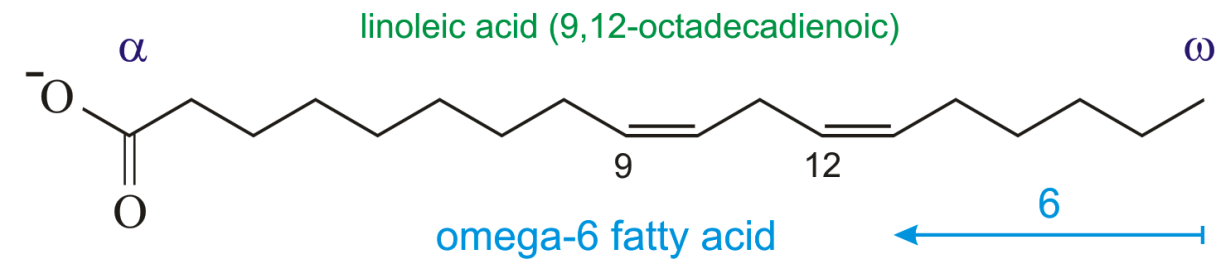
FATS

❖ Linolenic acid (ALA), an omega-3 fatty acid

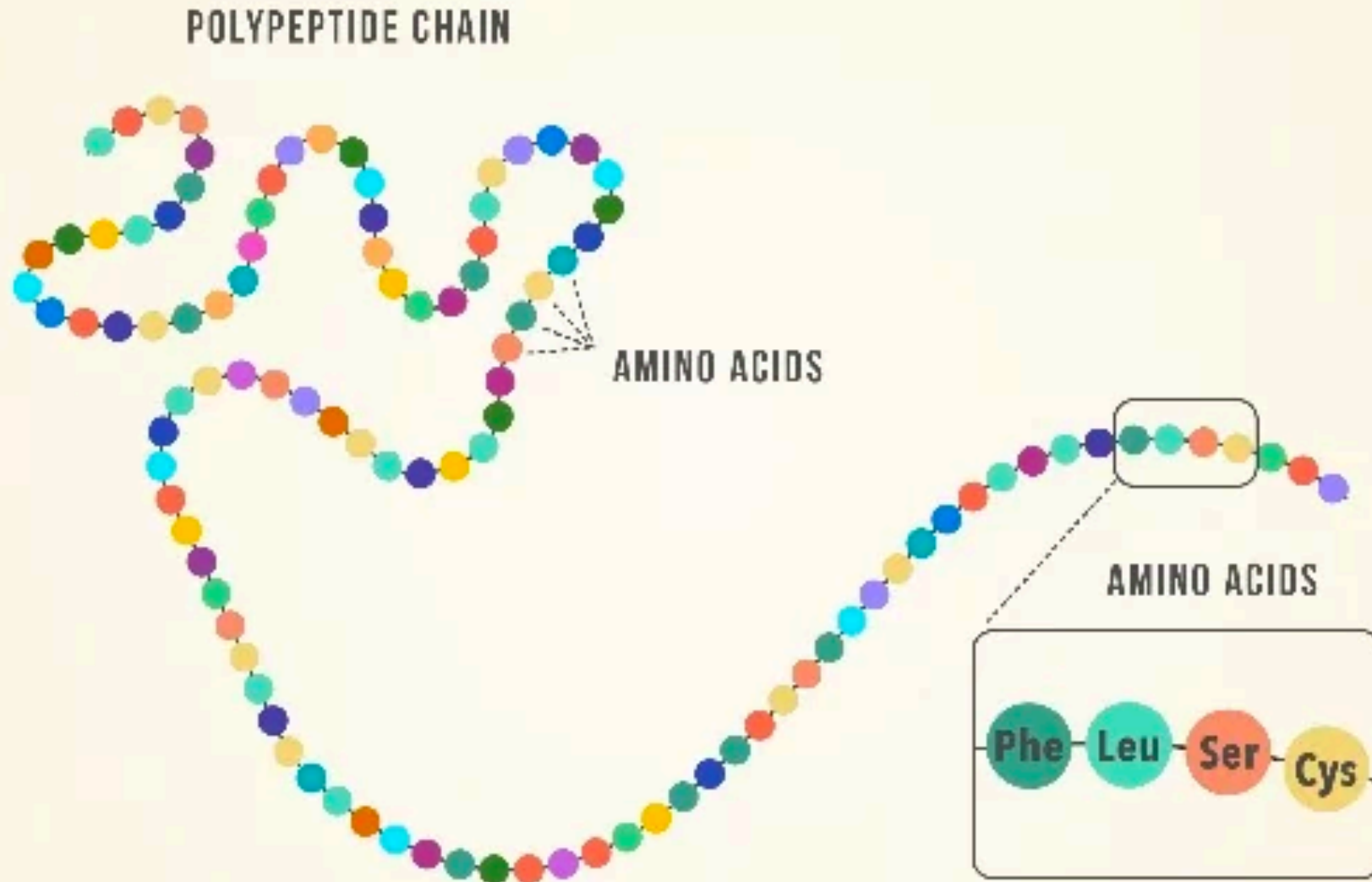
❖ Found in fish, flaxseeds and walnuts

❖ Linoleic acid (LA), an omega-6 fatty acid

❖ Found in nuts, most vegetable oils and some whole grains



PROTEINS; ESSENTIAL AMINO ACIDS:



- ❖ Arginine
- ❖ Histidine
- ❖ Isoleucine
- ❖ Leucine
- ❖ Lysine
- ❖ Methionine
- ❖ Phenylalanine
- ❖ Threonine
- ❖ Tryptophan
- ❖ Valine

CARBOHYDRATES



WATER

An underwater photograph showing a splash of water. The water is clear and blue, with numerous bubbles and droplets of various sizes rising from the bottom. The lighting is bright, creating a shimmering effect on the water's surface and highlighting the individual droplets.

From The U.S. National Academies of Sciences,
Engineering, and Medicine:

About 11.5 cups (2.7 liters) a day for women

About 15.5 cups (3.7 liters) a day for men

You get an average of 20 percent of your water from

Nutrition Facts

Serving Size 1 package (272g)
Servings Per Container 1

Amount Per Serving

Calories 300 Calories from Fat 45

% Daily Value*

Total Fat 5g 8%

Saturated Fat 1.5g 8%

Trans Fat 0g

Cholesterol 30mg 10%

Sodium 430mg 18%

Total Carbohydrate 55g 18%

Dietary Fiber 6g 24%

Sugars 23g

Protein 14g

Vitamin A 80%

Vitamin C 35%

Calcium 6%

Iron 15%

* 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
Saturated 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

Vitamins and minerals, also called *micronutrients*, are required by the body in relatively small amounts and support many body processes.

Vitamins and minerals are nutrients to get more of.

Vitamins and Minerals

What They Are

- **Vitamins** are organic substances made by plants and animals, which are then eaten by humans.
 - There are 13 vitamins: vitamins A, C, D, E, K, and the B vitamins (thiamin, riboflavin, niacin, pantothenic acid, biotin, vitamin B₆, vitamin B₁₂, and folate).
 - You can get all your vitamins from the foods you eat, but your body also makes vitamins D and K.
- **Minerals** are inorganic substances that are not made by living things.
 - Minerals are found naturally in soil and water and are absorbed by plants, which are then eaten by people and other animals. Examples of minerals are iron, calcium, and potassium.
 - People obtain minerals from both the plant and animal products they eat.

Where They Are Found

Vitamins and minerals are found in a variety of foods, including:

- Beans and peas
- Dairy products
- Eggs
- Fortified foods (such as breakfast cereals and soy beverages)
- Fruits
- Meats and poultry
- Nuts and seeds
- Seafood
- Vegetables
- Whole grain foods (such as brown rice and whole grain breads, cereals, and pasta)

What They Do

The human body needs the right “mix” of nutrients for good health. That not only means getting the right amount of carbohydrate, protein, and fat (as also called *macronutrients*), but also the right amount of vitamins and minerals (also called *micronutrients*). Micronutrients help your body use macronutrients and support many body processes, including:

- Blood pressure regulation
- Blood sugar regulation
- Brain function
- Digestion
- Growth and development
- Heart function
- Hormone production
- Immune function
- Metabolism of drugs and toxins
- Muscle contraction
- Nervous system function
- Protein, carbohydrate, and fat metabolism
- Red blood cell formation
- Reproduction
- Taste and smell
- Vision
- Wound healing

See the [Vitamins and Minerals Chart](#) for functions that each vitamin and mineral performs in the body.

Health Facts

- The majority of Americans get the recommended amounts of most vitamins and minerals to meet their needs. However, many people do not get the recommended levels of some important micronutrients. These nutrients are considered to be “nutrients of public health concern” because low intakes are associated with potential health risks and include:
 - Calcium
 - Iron (of concern for young children, pregnant women, and women capable of becoming pregnant)
 - Potassium
 - Vitamin D
- The *Dietary Guidelines for Americans* recommends choosing a variety of ***nutrient-dense** foods that are good sources of vitamins and minerals, especially calcium, iron, potassium, and vitamin D.

Also, see the [Vitamins and Minerals Chart](#) for examples of what foods are good sources of the different micronutrients.

*Nutrient-Dense: Defined

Nutrient-dense foods and beverages contain vitamins, minerals, dietary fiber, and other beneficial substances that may have positive health effects. They are also naturally lean or low in saturated fat and have little or no added saturated fat, sugars, refined starches, and sodium. Examples of nutrient dense foods are: beans and peas, eggs, fat-free (skim) and low-fat (1%) dairy products, fruits, seafood, lean meats and poultry, unsalted nuts and seeds, vegetables, and whole grains.

Action Steps

For Consuming a Nutrient-Dense Diet

Use the **Nutrition Facts Label** as your tool for consuming a nutrient-dense diet rich in vitamins and minerals. The Nutrition Facts Label on food and beverage packages shows the Percent Daily Value (%DV) for vitamin A, vitamin C, calcium, and iron in **one serving** of the food.

Food manufacturers may *voluntarily* list the %DV of other naturally occurring vitamins and minerals per serving on the Nutrition Facts Label, but they are *required* to list any vitamins and minerals that are added to the food or if a statement is made on the package labeling about their health effects or the amount contained in the food (for example, “high” or “low”).

- When comparing foods, choose foods with a higher %DV of vitamin A, vitamin C, calcium, and iron. The goal is to get 100% of the Daily Value for these nutrients on most days. And remember:
 - 5% DV or less of a vitamin or mineral per serving is low
 - 20% DV or more of a vitamin or mineral per serving is high
- Consume at least half of your daily fruit choices as whole fruits (such as fresh, frozen, cooked, dried, and canned in 100% fruit juice). Choose 100% fruit juice instead of sugar-sweetened beverages (such as energy drinks, flavored waters, fruit drinks, soft drinks, and sports drinks). Try fruit as snacks, salads, side dishes, and desserts.
- Eat more colorful vegetables (such as fresh, frozen, canned, and dried) and 100% vegetable juices. Buy frozen (without butter or sauce) or low sodium or no-salt-added canned vegetables. Try vegetables as snacks, salads, and side dishes and incorporate vegetables into main dishes.
- Consume at least half of your total grain choices as whole grains (such as brown rice, whole oats, and whole wheat). Whole grains are a source of important vitamins and minerals and are typically high in fiber, too. Switch from refined to whole grain versions of commonly consumed foods (such as breads, cereals, pasta, and rice). Limit refined grains and products made with refined grains, especially those high in calories, saturated fat, added sugars, and/or sodium (such as cakes, chips, cookies, and crackers).
- Eat a variety of protein foods, such as beans and peas, fat-free (skim) or low-fat (1%) dairy products, eggs, lean meats and poultry, seafood (fish and shellfish), soy products, and unsalted nuts and seeds. Choose seafood and plant sources of protein (such as soy products, beans and peas, and unsalted nuts and seeds) in place of some meats and poultry. Add beans or peas to salads, soups, and side dishes, or serve them as a main dish. Snack on a small handful of unsalted nuts or seeds rather than chips or salty snack foods.
- Substitute fat-free (skim) or low-fat (1%) dairy products (such as cheese, milk, and yogurt), or fortified soy beverages for regular/full-fat (whole) dairy products.



ESSENTIAL MICRONUTRIENTS

Nutrient	Body Role and/or Health Benefit	Food Sources
Calcium	Bone and teeth health. Necessary for muscles, nerves, and glands.	Dairy products, leafy-green vegetables, fish (with bones), fortified products, and beans/legumes.
Fiber	Reduced risk for coronary heart disease, maintains healthy bowels	Fruits and vegetables and whole grains.
Folate	Reduced risk for birth defects in the brain or spinal cord.	Liver, asparagus, oranges, beans/legumes, and fortified products.
Magnesium	Bone health and normal body functioning.	Nuts, seeds, leafy-green vegetables, bananas, whole grains.
Potassium	Maintenance of a healthy blood pressure.	Fruits and vegetables
Sodium	Needed for normal cellular functioning, although most people consume too much.	Highly and ultra-processed foods and beverages, sauces and gravies.

Nutrient	Body Role/Health Benefit	Food Sources
Vitamin C	Wound healing and healthy gums and teeth.	Citrus fruits, bell peppers, leafy-green vegetables.
Vitamin A	Eye, skin, and immune system health	Liver, egg yolks, fish, and dark orange fruits and vegetables
Vitamin D	Heart, bone, immune system, and nervous system health	Fish, dairy, eggs.
Beta-carotene	Immune system, vision, skin, and bone health	Pumpkin, Sweet Potato, Carrots, Winter Squash, Cantaloupe, Apricots, Spinach, Collard Greens, Kale, Broccoli.
Lycopene	Reduced risk for prostate cancer and heart health	Tomatoes and Tomato Products, Pink Grapefruit, Red Peppers, Watermelon.
Lutein	Eye and heart health and reduced risk for some cancers.	Collard Greens, Kale, Spinach, Broccoli, Brussels Sprouts, Lettuces, Artichokes.
Resveratrol	Heart and lung health and reduced risk for some cancers. Reduced inflammation.	Peanuts and grapes.
Anthocyanidins	Blood vessel health and reduced risk for some cancers.	Blueberries, Blackberries, Plums, Cranberries, Raspberries, Red Onions, Red Potatoes, Red Radishes, Strawberries.
Isoflavones	Bone and joint health, lower cholesterol, and reduced risk for breast cancer and inflammation.	Soybeans, tofu.





ACTIVITY: NUTRIENT DENSITY

Scientists have identified which fruits and vegetables have the highest nutrient density.

Can you guess what they are??

LIST 5 FRUITS THAT YOU THINK HAVE A REALLY HIGH NUTRIENT DENSITY:

- 1.
- 2.
- 3.
- 4.
- 5.

LIST 5 VEGETABLES THAT YOU THINK HAVE A REALLY HIGH NUTRIENT DENSITY:

- 1.
- 2.
- 3.
- 4.
- 5.

The 7 Most Nutritious Greens



#1 WATERCRESS
Nutrition Score: 100



#2 CHINESE CABBAGE
Nutrition Score: 91.99



#3 CHARD
Nutrition Score: 89.27



#4 BEET GREENS
Nutrition Score: 87.08



#5 SPINACH
Nutrition Score: 86.43



#6 CHICORY
Nutrition Score: 73.36



#6 LETTUCE
Nutrition Score: 70.73

NUTRIENT-DENSITY LIST FOR COMPARISON — TABLE FROM DI NOIA, 2014.

Table 2. Powerhouse Fruits and Vegetables (N = 41), by Ranking of Nutrient Density Scores^a, 2014



Item	Nutrient Density Score
Watercress	100.00
Chinese cabbage	91.99
Chard	89.27
Beet green	87.08
Spinach	86.43
Chicory	73.36

Leaf lettuce	70.73
Parsley	65.59
Romaine lettuce	63.48
Collard green	62.49
Turnip green	62.12
Mustard green	61.39
Endive	60.44
Chive	54.80
Kale	49.07
Dandelion green	46.34
Red pepper	41.26
Arugula	37.65
Broccoli	34.89
Pumpkin	33.82
Brussels sprout	32.23
Scallion	27.35
Kohlrabi	25.92
Cauliflower	25.13
Cabbage	24.51
Carrot	22.60
Tomato	20.37
Lemon	18.72
Iceberg lettuce	18.28
Strawberry	17.59
Radish	16.91
Winter squash (all varieties)	13.89
Orange	12.91
Lime	12.23
Grapefruit (pink and red)	11.64
Rutabaga	11.58
Turnip	11.43
Blackberry	11.39
Leek	10.69
Sweet potato	10.51
Grapefruit (white)	10.47

FOOD CANNOT REPLACE ALL MEDICINES

FOODS CAN PROMOTE A LONG HEALTHY LIFE

Berries. Protect against chronic conditions, including certain cancers.

Cruciferous vegetables. Broccoli and kale contain antioxidants, may decrease your risk of heart disease and promote longevity.

Fatty fish. Salmon, sardines, and other fatty fish fight inflammation with high levels of omega-3 fatty acids, protect against heart disease.

Mushrooms. Compounds in mushrooms boost your immune system, heart, and brain.

Spices. Turmeric, ginger, cinnamon, and other spices are packed with beneficial plant compounds. [turmeric](#) helps treat arthritis and metabolic syndrome.

Herbs. Parsley, oregano, rosemary, and sage not only provide natural flavor to dishes but also boast many health-promoting compounds.

Green tea. Reduced inflammation and lower disease risk.

Questions?

**BY EATING A
BALANCED DIET, WE
CAN ACHIEVE
OPTIMAL HUMAN
AND
ENVIRONMENTAL
HEALTH**

