



Jr. Chef Club II Cooking with Colors II Focus on Fruits

Lesson 6



Educator Information Preparing to Teach the Lesson

Vitamins for Good Health

Vitamins are another essential micronutrient. Essential means that the body either cannot make these substances or cannot make enough of them. Therefore, vitamins must be obtained from food.

Vitamins are found in both plant and animal foods. It is best to get one's vitamins by eating a variety of minimally-processed foods. There are 13 vitamins that are essential to human health. They are divided into two categories:

Water Soluble Vitamins

The B-complex of vitamins and vitamin C are water soluble. This means they dissolve in water and because they are, they cannot be stored in our body. We need to eat them daily. Because we do not store them, they cannot build up to unhealthy (toxic) levels, we merely excrete any excess via the urine.

There are eight B vitamins:

- Thiamin [B1]
- Riboflavin [B2]
- Niacin [B3]
- Biotin
- Pantothenic acid
- B6 [pyridoxine]
- Folate (sometimes called folic acid)
- B12 [cyanocobalamin]

Note: the terms in brackets are the less-used or formerly used term. Use the terms *not* in brackets.

In general, the B vitamins help to release energy from food; some have additional functions as well.

Vitamin C plays numerous roles in the body, including collagen production as described in the lesson. It also serves as an antioxidant, helping to protect cells from damaging oxidation that can occur from pollution, UV rays, chemical exposures, cigarette smoke, etc.

Another substance, Choline, is not considered a vitamin because the body can usually make enough of it. However, you will notice that there are DRIs established for it and it is listed on charts alongside the vitamins. It is also plentiful in foods such as egg yolks, organ meats, spinach, nuts and wheat germ.

Fat Soluble Vitamins

Vitamins A, D, E and K are fat soluble. This means they dissolve in fat and because of that characteristic, can be stored in the body with fat. Because of this, we do not need to eat them daily and typically need them in quite small amounts. Because they can be stored in the body, there is potential to build up to toxic levels and then cause health problems. However, this does not happen just from eating food (repeatedly eating large amounts of liver is an exception). Toxicity from fat soluble vitamins is only a concern if taking high potency supplements that are high in these vitamins.

How Much Do We Need?

See the discussion in Jr. Chef Level II, Lesson 5 about Daily Reference Intake (RDI) amounts, Recommended Dietary Allowances (RDAs) and Adequate Intakes (AIs).

The B-complex vitamins are not listed below because they are not covered individually in the lesson. If you need the values for the eight (or nine) different B-vitamins, refer to the web site listed below.

Years of age	Vitamin A	Vitamin C	Vitamin D	Vitamin E	Vitamin K
Boys 9-13	600 ug	45 mg	5 ug	11 mg	60 ug
Girls 9-13	600 ug	45 mg	5 ug	11 mg	60 ug

Note: Amounts listed in plain type are RDAs, those in bold type are AIs.

ug=micrograms (1/1,000,000 of a gram)

Source: Dietary Reference Intake Tables: The Complete Set. Institute of Medicine, National Academy of Sciences. www.nap.edu

Vitamin Information

See the Lesson Plan for basic information to share with students about these vitamins.

Reliable and reviewed information on vitamins is also available at:

Info on vitamins:

http://kidshealth.org/kid/stay_healthy/food/vitamin.html

Enrichment and Fortification

When foods are processed, they typically lose some of their vitamins (and minerals). A prime example is the processing of whole wheat flour into white flour. Many vitamins and minerals are lost when the bran and germ of the whole wheat kernel are removed. To prevent nutrient deficiencies in the population, it is required by law that certain vitamins (and one mineral, iron) be replaced in wheat flour. Selected nutrients (not all of them) are replaced in amounts equal to or greater than the amounts naturally occurring in the whole grain. This process is called enrichment.

Fortification is the process of adding a nutrient to a food where it was not naturally present in significant amounts. An example of this would be vitamin D added to milk, or calcium added to orange juice.

Making the Most of the Vitamins in Food

The way food is stored and prepared can affect the amount of vitamins it contains. All vitamins are made up of several different chemical elements held together by chemical bonds. Heat, air and light can break these bonds apart and then the vitamin is destroyed. It's important that we handle foods properly so they don't lose the vitamins they have. For instance, put most fruits and vegetables in the refrigerator where there is no heat or light—this helps preserve the vitamins in them. And when you cook them, cook lightly. Steam a vegetable just until it's crunchy-tender rather than covering with water and cooking until soggy. The less a vegetable or fruit is cooked, the more vitamins it will retain.

Another thing you can do to protect vitamins is to not cut fruits or vegetables very far ahead of when you're going to eat them—doing so exposes much more surface area to air and the air begins to destroy vitamins. Have you ever cut apples but not eaten them right away? Raise your hand to tell us what happens to the apples when you do that? (Turn brown) To keep this from happening, you can dip apple slices into water with lemon juice; this delays them from turning brown and protects the apple. You can also wrap cut fruits or veggies tightly with plastic wrap so that air cannot get to the cut edges.

Do I Need a Vitamin Supplement?

Students often wonder whether they need to take a vitamin and/or mineral supplement. Generally, it's best to get our nutrients from food. A supplement doesn't have all the protein, carbohydrates, fat, fiber and phytochemicals that we get from foods so we certainly cannot live on supplements alone. Suggest that students eat minimally processed foods in amounts suggested by MyPyramid then they usually won't need a supplement. However, taking a one-a-day type of vitamin for "insurance" is usually not harmful, but they should ask their health care provider for guidance.

More on Phytochemicals

Fruits, like vegetables, are abundant in phytochemicals. Some of these plant chemicals hold so much promise that an RDI or AI may be established for some of them in the near future.

See the Educator Notes from the previous lesson (Lesson 5) for more information on phytochemicals.