

FACT SHEET NONDAIRY BEVERAGES

By Team, General Conference Nutrition Council

Nondairy Beverages

Soy milk was first developed in the U.S. by Dr. John Harvey Kellogg, who was the inventor of cornflakes and granola and head of the Battle Creek Sanitarium for more than 50 years. A student of Kellogg's, Dr. Harry W. Miller, took Kellogg's knowledge of soy milk with him to China. Miller developed processes to make the soy milk more palatable and began production on a factory scale in China in 1936.

In various developing countries the scarce supply of cow's milk has made it desirable to invest in the development of plant protein beverages. Dietary constraints (avoidance of cholesterol and saturated fat), religious convictions (Buddhism), ethical philosophy (Save the Planet) and personal choice (dislike of dairy products, fear of milk born diseases) have led others to be interested in the use of alternatives to cow's milk. In addition, medical reasons (lactose intolerance, allergies) have prompted a growing interest in milk alternatives.

Today's replacements for dairy milk are variously referred to as milk substitutes, milk beverage alternatives, and nondairy beverages. Soy milks are just one example of such beverages available on the market today.

Major Ingredients

Nondairy beverages are usually based upon one of the following: soybeans, tofu, grains, vegetables, nuts, and seeds.

Whole soybeans are used as the main ingredient in most nondairy beverages. Many

labels list the beans as organic whole soybeans to attract customers who prefer naturally grown products. Soy protein isolate, a concentrated protein derived from soybeans, is the second most common main ingredient. A few products use tofu as the main ingredient. Tofu is made from pureed soybeans as cottage cheese is made from cow's milk.

Other products use grains, vegetables, nuts, and seeds (such as rice, oats, green peas, potato, or almonds) as a major ingredient. Home recipes for nondairy beverages use soybeans, almonds, cashews, or sesame seeds.

Acceptability

Nondairy beverages are often judged for acceptability first by sight and smell. If the product is a caramel or tan color, it may be rejected as a replacement for cow's milk before it has even been tasted. White or cream-colored products are more readily accepted. Off-odors also bias the acceptability of a product.

Factors that negatively impact the acceptability of a nondairy beverage include taste (too sweet, too salty, chalky), consistency (too thick, too watery, grainy, gritty, pasty, oily), and aftertaste (bean flavor, bitter flavor, medicine flavor).

Product Formulation

The most common nutrients added to a nondairy beverage are those nutrients found abundantly in cow's milk. These nutrients include: protein, calcium, riboflavin (vitamin B2), cobalamin (vitamin B12) and vitamin A. Cow's milk and some commercial nondairy beverages are fortified with vitamin D.

Of the many nondairy beverages on the market today there is a wide variation of philosophies on the amount and kind of fortification for these products. Some products have absolutely no fortification, while other products are heavily fortified to closely proximate cow's milk in nutritional profile. Nondairy beverages made in the home most often have no fortification, and therefore, are not comparable to the nutrient content of dairy milks. They are lacking in calcium, vitamin B12, and vitamin D.

Milk's Position in the Food Guide Pyramid

Milk, yogurt, and cheese are found at the third level of the Food Guide Pyramid. The pyramid is a graphic depiction of the Dietary Guidelines for Americans. It was designed to depict variety, moderation, and proportion in the diet. Milk, yogurt, and cheese are rich sources of calcium, protein, riboflavin (vitamin B2), vitamin B12, and vitamin A, and are fortified with vitamin D.

Teenagers, adults under 25 years of age, and women should aim for a minimum of three servings per day in the milk, yogurt, and cheese, or the dairy alternatives group. When you are making selections, look for low-fat and nonfat products. However, children under two years of age need the concentrated energy that comes from whole milk, and should not be given low-fat and skim milk to drink.

Nonfat milk, low-fat cheese, fat-free frozen dairy desserts and nonfat frozen yogurt are all healthy choices for adults. Fat-free cottage cheese, while a good source of protein, is not abundant in calcium. If using cottage cheese as a calcium source, one would need to eat more as the process used precipitates the calcium into the whey. One cup of cottage cheese is equal to the calcium in only a half cup of milk. Brands of tofu that are prepared with calcium sulfate or other calcium products have acceptable calcium levels. However, if magnesium chloride or similar products are used, they do not contain adequate calcium. Read the labels carefully to determine calcium content of the tofu you are using, and consider switching to a calcium-rich tofu product if the one you currently use is low in this important nutrient.

Comparable Nutritional Value

While acceptable taste is an important consideration in selecting a non-dairy beverage, the nutritional value should be more important. One should select a fortified brand that contains at least 20-30 percent of the U.S. RDA for calcium, riboflavin, and vitamin B12 values which are similar to the nutritional profile of dairy milk. For those who live in northern latitudes (in which winter sunlight is too weak for vitamin D synthesis) a nondairy beverage should be chosen that is fortified with vitamin D.

Alternatives to dairy include a variety of tofu, nondairy beverages and cheeses. If using nondairy foods, it is important to choose a product that is fortified with calcium, vitamin B12, riboflavin and vitamin D. While one glass of milk provides up to 25 percent of the calcium an adult needs per day some nondairy beverages provide only 1 percent of the calcium in an eight ounce glass. Choose nondairy beverages that provide at least 25 percent of the calcium needed for each day. Look for products that have calcium listed as an added ingredient on the label. These nondairy beverages should also contain vitamin B12 and vitamin D in the ingredient list.

Uses in Cooking

A common misconception is that nondairy beverages can be substituted for dairy milk in any recipe. The biggest problems in cooking occur during the heating/cooking/baking of the nondairy beverage. Nondairy beverages that are soy-based or that are highly fortified with calcium carbonate tend to curdle at high temperatures. This problem is intensified; more so than cow's milk, if an acidic food (tomatoes, oranges) is also used. An advantage to cooking with nondairy beverages is that at high temperatures there is less scorching than occurs with dairy milk.

Consistency or texture changes may be unpredictable when substituting a nondairy beverage. For example, most instant puddings do not set when a nondairy beverage is substituted for dairy milk. When making gravies, a higher percentage of thickening agent (starch) needs to be used if using a soy-based beverage. Grain-based beverages, such as those containing oats, rice, or the starch in potatoes, will thicken well.

Flavor is another factor in selecting a nondairy beverage and using it in cooking. A sweet or vanilla flavor is hardly suitable for soups or soy recipes.

As a general rule, soy-based nondairy beverages have a thicker, richer, and creamier texture than grain or nut based non-dairy beverages. Rice-based nondairy beverages have a lighter, sweeter flavor, and for many people, more closely imitate the flavor of dairy milk. Nut-based nondairy beverages are better for sweeter dishes including curries and desserts of all kinds. Experimentation in replacing dairy milk with nondairy

beverages is often the best teacher.

Interpreting Labels

The following terms are commonly found on nondairy beverages product labels:

1 percent fat: this means 1 percent by weight of the product, not 1 percent of the kilocalories. Low-fat 1 percent cow's milk contains 27% of the kilocalories from fat.

Cholesterol-free: This is a correct term, but remembers that all nondairy beverage products are cholesterol-free because all are manufactured from plants. No plant contains cholesterol.

Light/Lite/Fat-free: Some low-fat products are high in kilocalories. One nondairy beverage product, while free from fat, contains 160 kilocalories per eight ounce glass. By comparison, one eight ounce serving of non-fat cow's milk contains 90 kilocalories. The extra kilocalories in nondairy beverages come from carbohydrates usually in the form of simple sugars.

Tofu: Some products claiming to be tofu nondairy beverages have, as their first ingredient, sugar or sweetener; second ingredient, oil; third ingredient, calcium carbonate (a calcium supplement); and finally tofu as the fourth, fifth, or sixth ingredient. This may mean that tofu nondairy beverages are mainly carbohydrate and oil based and not tofu.

Guidelines for Selecting a Nondairy Beverage

In selecting a non-dairy beverage consider the following:

- 1. Choose a nondairy beverage that is fortified with at least 30 percent of the U.S. RDA for calcium, riboflavin, vitamin B12 and vitamin D.
- 2. Depending upon your personal nutritional goals, choose a nondairy beverage that is either low-fat or regular fat.
- 3. Nondairy beverages, if chosen to replace dairy products, are replacing an important food group supplying critical nutrients.
- 4. Label reading is important, as formulas change over time.
- 5. The position of the General Conference Nutrition Council is that nondairy beverages are unsuitable for infants. Nondairy beverages are generally lacking sufficient protein and fat and have not been formulated for the immature digestive system of an infant. Nondairy beverages are hazardous to babies' healthy growth. A specially designed soy-based commercial infant formula should be used for an infant up until at least 12 months of age. However, breast feeding is recommended when possible.
- 6. Although a highly refined product ,when properly fortified, plant beverages can be a suitable substitute for dairy milk.

Bibliography

Lee, C. & L.R. Beuchat, Chemical, Physical, and Sensory Characteristics of Peanut Milk as Affected by Processing Conditions, Journal of Food Science 57 No. 2 (1992), pp. 401-405.

Nussinow, J. Moove Over Milk, Vegetarian Journal, Jan/Feb 1996, pp. 14, 15.

Messina, V. A Compendium of Milk Substitutes, Issues in Vegetarian Dietetics, 1, No.4 (1992):7.

Ryan, N.R. Milk by Many Other Names, Vegetarian Times, March 1997, pp. 98, 100-103.

Shurtless, W. and A. Aoyagi, Tofu and Soy Milk Production, Soyfood Center, LaFayette, Calif.

Singh, T. and G.S. Bains, Grain Extract-Milk Beverage: Processing and Physiochemical Characteristics, Journal of Food Science, 53 No.5: 1387-1390.