

Milk

An opaque white fluid rich in fat and protein, secreted by female mammals for the nourishment of their young.



THE MILK PASTEURIZATION PROCESS

[HOW IT WORKS]

- Unpasteurized milk can harbor dangerous bacteria that can pose serious health risks to you and your family, according to the CDC. Pasteurization kills these bacteria.
- With the exception of milk that's marketed as raw milk, all U.S. milk is pasteurized.

STEP 1



Once the farmer milks the cow, the milk is kept at a chilled temperature of 39° F.

STEP 2



The milk then heads to a milk plant where it is heated to 161° F.

STEP 3



After 15 seconds, it is quickly cooled back down to its original temperature of 39° F.

[BEFORE & AFTER]

NUTRIENT CONTENT

MILK BEFORE PASTEURIZATION



Raw milk contains a miniscule amount of vitamin C (3.7 mg) that doesn't survive the pasteurization process. By comparison, orange juice contains about 64 mg.

MILK AFTER PASTEURIZATION



Vitamin D and additional vitamin A are added to pasteurized milk to make it more nutritious.

DairyGood

Did You Know?

As defined, milk must come from a mammal, which means that any plant-based beverages that use milk in their labeling aren't technically milk.

Keeping Milk Safe

Milk is a perishable food product requiring specific handling to reduce the pathogens that cause food-borne illnesses. Milk fresh from a cow is called 'raw milk.' Raw milk is illegal in most states and is deemed unsafe by local and national organizations like the FDA and CDC.

In 1862 Louis Pasteur discovered a process called pasteurization which kills bacteria, and makes milk even safer for consumers. Today, most milk is pasteurized by heating it to a high temperature (161° F) for a short amount of time (15 seconds) This process kills bacteria that can cause food-borne illness without effecting the nutritional value of the milk.

Milk Nutrition

USDA Recommendations

Healthy eating patterns include fat-free and low-fat (1%) dairy, including milk, yogurt, cheese, or fortified soy beverages (commonly known as “soymilk”).

The recommended amounts of dairy in the Healthy U.S.-Style Pattern are based on age rather than calorie level.

Age (years)	Recommended 1-cup servings
2-3	2
4-8	2 ½
9-adulthood	3



Pros

- 8 grams of protein in one glass
- Natural source of calcium, vitamins and minerals
- Low-cost

Cons

- May cause digestive symptoms for those with lactose intolerance
- Unsuitable for those with
 - Milk protein allergy
 - Lactose Intolerance
 - Chronic kidney disease
 - Very low calorie diet

Nutrition

Whole Milk

Serving size: 8 oz.

Calories 100

% Daily Value

Total Fat 2.5g

4%

Total Carbohydrate 12g

4%

Protein 8g

16%

Calcium, natural

30%

Ingredients: LOW-FAT MILK, VITAMIN A, VITAMIN D



- Calcium
- Phosphorus
- Vitamin A
- Vitamin B12
- Vitamin D
- Riboflavin
- Potassium
- Niacin

From Cow to Cup

At the Dairy



Cows are milked daily.



Milk is immediately cooled and stored in a tank. This is considered raw milk.

On the Tanker



The milk is tested for safety and transferred to a truck where it is kept cool and transferred from the farm to a processing plant.

At the Processing Plant



Pasteurization

Milk is heated and then cooled to kill bacteria and prevent the further growth of bacteria.



Homogenization

The fat droplets are emulsified so the cream does not separate.



Packaging

The milk is then packaged as fluid milk, or sent off to be processed into other dairy products.

In the Store and to Your Home



Approximately 48 hours later, the milk is in the store and ready for you to enjoy.

Soy

Soy beverage was first developed 2000 years ago in China. It was the first plant-based milk to serve the purpose of providing nutrients to the population where the milk supply was inadequate.



Soy Products

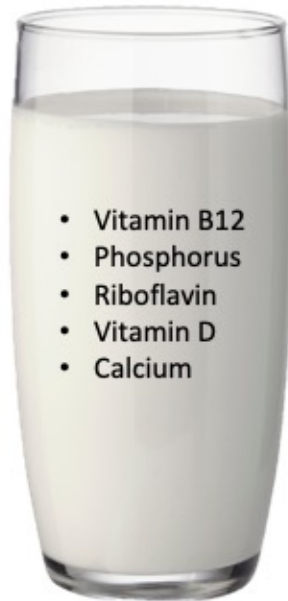
There are three main kinds of soybeans: green, black, and yellow. These are made into various foods such as tofu, tempeh, miso, soybean oil, flour, protein concentrate, or a soy beverage commonly known as soymilk.



USDA Recommendations

Soy beverages that are fortified with calcium, vitamin A and vitamin D are included in the dairy group because they are the most nutritionally similar to dairy milk.

Soy Nutrition



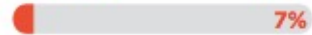
Soy Beverage

Serving size: 8 oz.

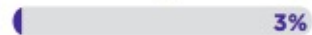
Calories 110

% Daily Value

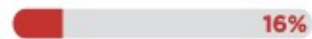
Total Fat 4.5g



Total Carbohydrate 9g



Protein 8g



Calcium, added



Ingredients: SOYMILK (FILTERED WATER, WHOLE SOYBEANS), CANE SUGAR, SEA SALT, CARRAGEENAN, NATURAL FLAVOR, TRI-CALCIUM PHOSPHATE, CALCIUM CARBONATE, VITAMIN A, VITAMIN D, RIBOFLAVIN, VITAMIN B12

Pros

- Soy beverages that are fortified with calcium, vitamin A and vitamin D are included in the dairy food group because they are the most nutritionally similar to dairy milk after fortification.
- Soy beverage is the only plant-based milk with the same amount of protein as cow's milk.
- It is a popular beverage choice amongst those who are lactose intolerant or have a milk protein allergy.
- Soy milk is a good source of essential monounsaturated and polyunsaturated fatty acids which are considered good for cardiovascular health.

Cons

- Beany flavor.
- Soybeans contain high levels of phytic acid, a compound sometimes referred to as an "anti-nutrient." This means it will bind minerals such as calcium, iron, magnesium, and zinc and can render these nutrients unavailable for absorption when eaten at the same time.

From Bean to Beverage

Fried, whole,
soybeans



Soak in water; drain

Blanche in fresh
tap water; drain



Heat mixture to 200° F



Grind through mill to
make 12% bean solids



Homogenize and add
water to desired
protein content level
and to neutralize pH.

Addition of sugar, salt,
and flavorings

Heat to 180° F and
homogenize again

Enjoy!

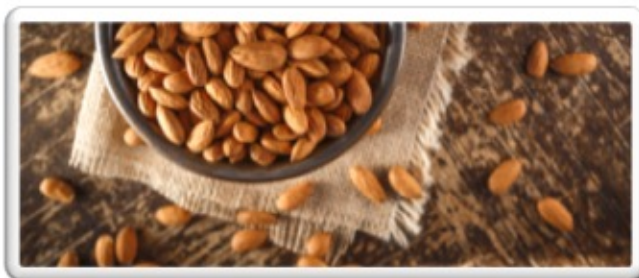


Package and cool to 34° F
for storage and transport



Almond

Almond milk dates back to the middle ages and was used by both Islamic and Christian people.



Almond Production

Two-thirds of the world's almonds are produced in the United States, and mostly in California. Almonds are harvested from orchards beginning in August and continuing through October and November.



Consumer Trends

Almond beverage sales have been increasing at dramatic speeds. In 2011 sales increased by 79%, and then surpassed soy beverage sales in 2013 to now comprise about 60% of plant milk.

Almond Nutrition

Almond Beverage

Serving size: 8 oz.

Calories 60

% Daily Value

Total Fat 2.5g

4%

Total Carbohydrate 8g

3%

Protein 1g

2%

Calcium, added

45%



- Vitamin B12
- Riboflavin
- Vitamin D
- Calcium

Ingredients: ALMOND MILK (FILTERED WATER, ALMONDS), EVAPORATED CANE JUICE, CALCIUM CARBONATE, SEA SALT, POTASSIUM CITRATE, CARRAGEENAN, SUNFLOWER LECITHIN, VITAMIN A, VITAMIN D, D-ALPHA-TOCOPHEROL

Pros

- Naturally a better source of vitamin E than other plant-based milks.
- Best known for being low in calories.

Cons

- Not suitable for individuals with a nut allergy.
- High cost.
- Can have a beany flavor.
- Low in protein because the protein in an almond is strained out of the final beverage in processing.
- Does not contain most B vitamins and essentially fatty acids.

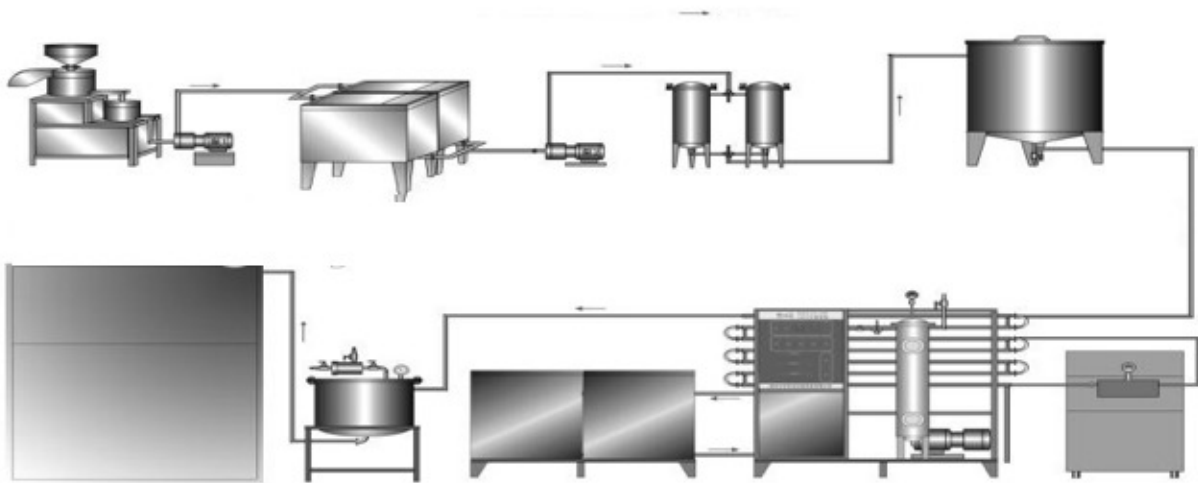
From Nut to Nectar

1. Crush whole almonds.



2. Mix an aqueous dispersion of oiled almond powder, mixed with about 0.1 % of a stabilizing hydrocolloid at 90° C.

3. Heat the mixture long enough to allow the compounds to solubilize.



4. Grind the mixture and then put it through a centrifuge to remove large particles.

5. Pasteurization

6. Homogenization

7. Addition of nutrients to fortify, and flavorings to improve taste.

8. Cooling

9. Packaged and shipped to a store near you.



Rice

The exact date of origin for rice milk is unknown. It was sold as a street food in the mid-19th century in London.

(At that time, it was made with 4 quarts of dairy milk to every pound of rice.)



Brown Rice

Rice milk is made from brown rice. Brown rice contains the entire grain of rice including the brown husk. White rice has the husk removed and only includes the inner layers of the grain.



Consumer Trends

A grain-based milk most commonly made with brown rice. It can be made by boiling down rice, or using rice flour and brown rice protein.

Rice Nutrition



Rice Beverage

Serving size: 8 oz.

Calories 120

% Daily Value

Total Fat 2.5g

4%

Total Carbohydrate 23g

8%

Protein 1g

2%

Calcium, added

30%

Ingredients: FILTERED WATER, BROWN RICE (PARTIALLY MILLED), EXPELLER PRESSED HIGH OLEIC SAFFLOWER AND/OR SUNFLOWER OIL AND/OR CANOLA OIL, TRICALCIUM PHOSPHATE, SEA SALT, VITAMIN A, VITAMIN D, VITAMIN B12

Pros:

- Good for individuals with allergies and those who choose a vegan diet.

Cons:

- Low in protein and fiber.
- Very little natural calcium.

From Grain to Glass

Hydrate the rice



Treat with enzymes to
breakdown the
starches to simple
sugars

Filter or centrifuge
the mixture in order
to eliminate the
insoluble fibers

Homogenize, pasteurize, then homogenize again



Emulsifiers
added so the
mixture
becomes the
consistency of
milk

Addition of flavorings and
nutrient fortification

Packaging

Shipped to a store near your home



Coconut

Coconut milk plays an important part in Southeast Asian cuisine. It is not only consumed as a beverage but used as an ingredient in a number of sweet and savory recipes.



Growing Coconuts

90 countries across the world grow coconuts. Indonesia, Philippines, India, and Brazil are the highest producing. Coconut trees need ample water.

Coconut milk is made from grated and squeezed coconut meat. In this form, it has a high fat content and is reserved for cooking in authentic Southeast Asian cuisine. A coconut milk beverage is diluted with water.



Did You Know?

Coconuts must mature between 10 and 13 months until the coconut kernel is hard and thick.

Nutrition Facts	
Serving Size 1 cup (240mL)	
Servings Per Container About 8	
Amount Per Serving	
Calories 70	Calories from Fat 40
% Daily Value*	
Total Fat 4.5g	7%
Saturated Fat 4g	20%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 30mg	1%
Potassium 50mg	1%
Total Carbohydrate 0g	0%
Dietary Fiber 0g	0%
Sugars 7g	
Protein 1g	
Vitamin A 10% • Vitamin C 0%	



Coconut Beverage



Coconut Beverage

Serving size: 8 oz.

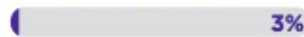
Calories 70

% Daily Value

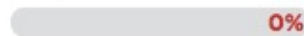
Total Fat 4.5g



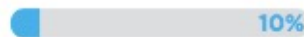
Total Carbohydrate 8g



Protein 0g



Calcium, added



Ingredients: COCONUT MILK (WATER, COCONUT CREAM), DRIED CANE SYRUP, CALCIUM PHOSPHATE, MAGNESIUM PHOSPHATE, CARRAGEENAN, GUAR GUM, VITAMIN A, VITAMIN D, L-SELENOMETHIONINE, ZINC OXIDE, FOLIC ACID, VITAMIN B12

Pros

- Rich in antioxidants, iron, calcium, potassium, magnesium, zinc, vitamin C, and vitamin E.
- Type of fat, (Lauric acid) is beneficial in boosting the immune system and maintaining healthy blood vessels.
- Rarely causes allergic reactions.

Cons

- Contains high amounts of saturated fat.
- Low in protein.

From Tree to Table

Coconut Preparation

De-husk whole coconut



Drill and drain coconut water



Milk Extraction

De-shell, split, grind, and grate coconut meat



Coconut milk is filtered and centrifuged to eliminate large particles and make a fine consistency

Processing

Pasteurization -
(double boiling at 70° C for 15 minutes)



Addition of emulsifiers,
flavorings, or nutrient
fortification

Cooling and Packaging



In the Store and to your home

