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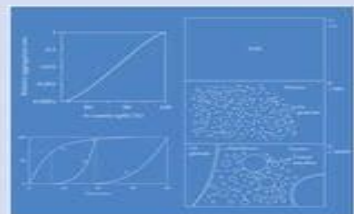
2nd Stage/ 2nd Semester

“Dairy Science and Technology”

Milk as a Food and its sources and health benefits

Dairy Science
and Technology

Second Edition



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Dairy science and technology

- Dairy science and technology is a field that covers the production and manufacturing of all dairy products as well as the machinery and methods used in the dairy industry.
- The largest part of the food supply chain.
- This industry is an integral part of our food economy that not only supplies consumers with many ready-to-eat products such as milk, butter, and cheese but also produces many of the ingredients like milk powder and condensed milk that are found in processed foods.
- Milk itself has also become a key ingredient as a probiotics and for the development of functional foods designed to improve consumer health.



Milk as a food

- Nutritionally, milk has been defined as “the most nearly perfect food”. It provides more essential nutrients in significant amounts than any other single food.
- Cow’s milk is the preferred choice for most people.
- In many cultures, especially in the West, humans continue to consume milk beyond infancy, using the milk of other mammals (especially cattle, goats and sheep) as a food product.



Milk Sources

- Milk can be obtained from many different sources, such as goats, cattle, buffaloes, and camels; yet, the cow milk is the most popular.
- Whatever the milk source is, it is greatly similar in terms of properties; however, the proportions of the nutritional elements slightly vary from one source to another.

Milk & Dairy foods in human nutrition

- Recognizing the importance of milk in the human diet, the USDA has promoted the consumption of milk since at least the mid-twentieth century.
- Another recent development in human nutrition is related to the establishment of “my plate.” It replaced the USDA’s MyPyramid guide on June 2, 2011, ending 19 years of USDA food pyramid diagrams. This clearly demonstrated that dairy foods become part of modern healthy diet.
- Official sources, such as the [Dietary Guidelines for Americans 2015–2020](#) [Trusted Source](#), recommend that adults eat about 3 cup-equivalent of low fat or fat-free dairy each day as part of a healthful diet.
- This amount can include milk, yogurt, cheese, and fortified soy beverages.

○ <https://www.myplate.gov/myplate-plan>

Milk and its nutritional value

- Milk is a widely consumed beverage that is essential to the diet of several millions of people worldwide because it provides important macro- and micronutrients.
- Milk is an essential component of the diet of ~6 billion people.
- Milk is recognized as being useful during childhood and adolescence because of its composition; however, its relatively high saturated fat proportion

WHY MILK IN DAILY DIET??

- Milk contains more of the known essential nutrients required for health than any other single food.
- Milk contains more utilizable calcium and good quality protein.
- Casein major milk protein has unique property of influencing its own digestion as well as other proteins fed with it.
- Conjugated linoleic acid of milk fat suppresses cancer, atherosclerosis and fat deposition in the body.
- Milk is an ideal food for elderly due to its high nutritive value.
- Milk is both a fast and convenient food no preparation, immediately ready for consumption

WHY MILK IN DAILY DIET??

- It is about 87 percent water and 13 percent solids.
- The fat portion of the milk contains fat soluble vitamins.
- The solids other than fat include proteins, carbohydrates, water soluble vitamins, and minerals.
- These nutrients in milk help make it nature's most nearly perfect food and it is seen as the only richest natural food in terms of the nutritional elements the body needs.

Importance nutrients/ Protein

- Milk products contain high quality proteins.
- The whey proteins constitute about 18 percent of the protein content of milk. Casein, a protein found only in milk, contains all of the essential amino acids.
- It accounts for 82 percent of the total proteins in milk and is used as a standard for evaluating protein of other foods. Protein is needed to build and repair body tissues and to form antibodies which circulate in the blood and help fight infection.

Other nutrients: minerals and vitamins

- Milk also contains the following nutrients: calcium, phosphorus, magnesium, and potassium.
- The calcium found in milk is readily absorbed by the body. Phosphorus plays a role in calcium absorption and utilization.
- Phosphorus is needed in the proper ratio to calcium to form bone. Milk provides these two minerals in approximately the same ratio as found in bone.
- Milk is also a significant source of riboflavin (vitamin B2) which helps promote healthy skin and eyes, as well as vitamins A and D.

Other nutrients/ calcium

- In adults, a calcium deficiency, along with other factors, may result in bone deterioration called osteoporosis.
- The recommendations for calcium are 1,000 milligrams for adults, 1,300 milligrams per day for adolescents, 500-800 milligrams per day for young children and 1,200 milligrams per day for adults over 51 years of age.

Other nutrients/ calcium

- One serving of milk has about 250 milligrams of calcium. It is difficult to obtain adequate calcium without milk and milk products in the diet.
- About 73 percent of the calcium available in the food supply is provided by milk and milk products.

Importance Milk in human diets/nutrition

- The following daily consumption of milk group foods is suggested by the government's U.S. Dietary Guidelines:
- Children 1-8 years old, 2 servings
- Children 9 years and older, 3 servings
- Adults, 3 servings

Functions/ purposes of milk in human body:

- it provides many of the nutritional elements necessary for the growth, reproduction, supply energy, maintenance and repair, and appetite satisfaction.
- The functions of a food are served specifically through the various nutritionally important components including proteins, carbohydrates, lipids, minerals, vitamins, and water.

Milk Health Benefits:

- Building and Maintaining bone and teeth.
- Preventing cardiac diseases
- Keeping the blood pressure at a normal rate.
- Protecting against some types of cancer/ colon cancer.
- Minimising the likelihood of developing the diabetes.
- Keeping & improving the performance of nerve system.
- Helping in growth
- Improving the digestion process.
- Boosting the immunity.
- Protecting the eyesight.
- Maintaining the skin, hair, and delicate membranes.
- Treating the dehydration.
- Providing the body with energy.

Groups In Need of Drinking More Milk:

- **Infant:** it is recommended depending on the mother's milk or the artificial milk meant for the breast-fed.
- **The elderly:** as we grow in age, the skin or kidney health condition changes, this in turn weakens its ability to produce vitamin D and change it into the active or effective formula.
- **The pregnant and those breast-feeding:** are mostly in need of many vitamins, such as vitamin D which the children need to absorb the calcium and form bones.
- **Fractures and after operations.**

Factors Affecting Benefiting from the Milk:

- Having beverages and food containing caffeine, such as fizzy beverages, tea, coffee, and chocolate reduces the absorbing of calcium.
- Not getting enough intakes of vitamin C rich fruits such as citruses, as it is instrumental in absorbing the calcium from the milk.