

Do You Know this About Milk?

J.B. Prajapati

Some Quotes from Our Ancient Treatises

- **Rig Veda (1-71-9) mentions that गोषु प्रियममृतं रक्षमाणा - means cow milk is Amrita. It protects us from disease. Hence protect the cows.**
- **Rigveda in another Mantra (5-19-4) describes “cow milk as the most desirable and likeable drink.”**
- **Atharva veda (4-21-6) depicts that the cow, through its milk, transforms a weak and sick person into an energetic person, provides vitality to those without it and by doing so, makes the family prosperous and respectable.**
- **Charak sutradhan (27-214) states that Cow’s milk is tasteful, sweet, has a fine flavour, is dense, contains fat, but light, easily digestible. It gives us tranquility and cheerfulness. Cow’s milk helps us build up vitality (OJAS).**

Brief Concept

Milk is a legally protected term for mammary gland secretion and cannot be used for imitation products extracted from plant or any other material that are synthetically blended white fluids, made to look like milk and intended to replace it. The only exception is coconut milk, as this term is traditionally used and is not meant to replace milk.

As per **CODEX** General Standards, adopted by the world, Milk is defined as the normal mammary secretion of milking animals without either addition to or extraction from it, intended for consumption as liquid milk or for further processing.

As per **FSSAI** legal definition in India, "Milk" means the normal mammary secretion derived from complete milking of healthy milch animal, without either addition thereto or extraction therefrom, unless otherwise provided in these regulations and it shall be free from colostrum.

Milk is natural, very complex fluid containing hundreds of macro and micro-nutrients meant for nourishing the new born. It contains no artificial additives, blends, or undergoes chemical processing, in contrast to plant-based imitation products.

World Milk Day

Food and Agriculture Organization of the United Nations (FAO) selected 1st June as World Milk Day since 2001. It celebrates the important contributions of the Dairy sector to Sustainability, Economic development, Livelihoods and Nutrition & Health all over the globe.

National Milk Day

Indian Dairy Association promoted celebrating birthday of Dr. Verghese Kurien, the milkman of India and Father of White Revolution as National Milk Day. Hence, 26th November is celebrated as National Milk Day since 2014.

A Glimpse of Indian Dairy Sector

India is a world leader in milk production and consumption since 1998 and likely to be the "Dairy to the World" in near future. At present, India produces 24% of the total world milk production amounting to 230.6 million tonnes in 2023-23, showing 5% increase over last year. Out of the total milk produced, only 25-30% is handled by organized sector and hence there is a tremendous scope for the dairy industry to grow and serve the nation by providing safe and secure milk and milk products. Milk is considered as nearly complete food, as it has all most all the nutrients required by the body. Milk and milk products play a very important role in human nutrition since centuries. They are also known to confer several health benefits apart from prevention of several diseases. Indian Dairy sector has unique small

Gross Average Composition of Milk				
Nutrient	Human	Cow	Buffalo	Goat
Water	87.5	87.7	83.2	86.9
Fat	4.2	3.6	7.5	4.0
Protein	1.2	3.3	4.0	3.7
Lactose	6.9	4.7	4.5	4.6
Ash (Minerals)	0.2	0.7	0.8	0.8

holder model, where almost 80-90% of the milk is produced by farmer holding 2-5 animals. This activity is a source of livelihood for more than 80 million rural households. The sector is an important job provider, especially for women, and plays a leading role in women's empowerment. Dairy business on cooperative model is a great success story of India, where unlike other businesses, 70-85% of the revenue goes back to the farmers. Valued at almost Rs. 10 lakh crores, milk is the largest agricultural crop of India.

Milk Myth vs Reality?

Milk, being the finest natural nourishment produced by mammals, has been cherished since ancient times for its nutritional value. However, in recent times, certain vested interests have sought to sow seeds of confusion among consumers. In response, IDA recognizes its responsibility to enlighten society with accurate, science-based information. Therefore, we aim to address and clarify certain misconceptions.

MYTH	REALITY
Milk is meant for infants only	Milk is natural nutritious food and can be consumed during the entire life span.
Milk has lactose, which cannot be digested	In regions where milk consumption has been a longstanding practice, the population tends to produce lactase enzyme throughout their lifetime, owing to an adaptive mutation that occurred thousands of years ago. Consequently, lactose, the sugar present in milk, can be effectively digested by the majority of individuals. Many studies on lactose intolerance are flawed, and while a small percentage of the population may experience lactose intolerance, options such as fermented milks and low-lactose/lactose free milk are readily available in the market to accommodate their needs. Lactose is very important sugar, because it contains galactose, which is essential for brain development.
Dairy means cruelty to animals	We are known to keeps cows or buffalo as a member of family. Production of milk is a natural phenomenon, and the animals are not milked, it can harm them. Milking does not involve torture or killing an animal or its offsprings. Cows/buffalos produce much more milk than what their offspring needs, and hence we need to milk them. If we don't milk, it will be a cruelty.
Milk has pesticides, antibiotics, hormones	Pesticides and antibiotics are not naturally synthesized by animals. However, they can enter their systems if they ingest contaminated feed or receive antibiotic treatment when sick. While some hormones may also be present in milk, adverse effects from their consumption are rarely reported. It's advisable to avoid milk from animals exposed to such

substances. Yet, when consuming pooled milk from a large number of animals, any potential concerns tend to diminish.

Milk fat is culprit for heart diseases

Milk fat was wrongly blamed for its association with CVD because under promotional influences of vegetable oil lobby. Subsequent clinical trials conducted to substantiate the hypothesis could never establish the causal link for CVD.

The unique nutritional value of bovine milk fat can be attributed to the presence of **short-chain fatty acids (SCFA) and medium-chain fatty acids (MCFA)** which are important sources of energy for the muscles, heart, liver, kidneys, blood platelets and nervous system. They do not pose an obesity risk; they prevent ulcerative colitis, cancer, atherosclerosis and hypertension; they have anti-inflammatory and antibacterial effects, and they boost natural immunity. Butyrate is anti-cancer agent.

Milk fat has conjugated linoleic acid (CLA) which helps to lose fat, maintain weight loss, retain lean muscle mass, and control type 2 diabetes.

Milk fat contains valuable lipids, such as **cholesterol, phospholipids and sphingolipids** having several beneficial effects on physiology and health. Docosahexaenoic acid (DHA) is an omega-3 fatty acid essential for brain development during pregnancy and early childhood. It is also linked to improved heart health, better vision, and reduced inflammatory response. In milk fat globules are covered with membrane (MFGM). The **MFGM components such as sphingomyelin and gangliosides**, improves the cognitive functions apart from several therapeutic properties.

Ghee is a superfood and hence our ancestor advised to regularly consume plenty of ghee.

Milk is a cause for higher prevalence of diabetes

Absolutely wrong and no scientific basis.

The Prospective Urban Rural Epidemiology (PURE) study conducted in 21 countries in 5 continents on 150,000 individuals in which 5 parts of India were also involved, showed that dairy consumption was associated with lower incident (new onset) of diabetes, hypertension, as well as metabolic syndrome. There seems to be a clear protection against diabetes after consumption of various dairy products, including milk (Dr V. Mohan, MDRF).

The health benefits of dairy consumption could be attributed to their lower Glycemic Index (GI). Recent study showed GI of plain milk as 21 and that of plain curd as 17, which cannot cause diabetes.

Plant proteins are superior to milk protein

Proteins, the building blocks of life, are composed of amino acids. To function optimally, the human body requires a balanced intake of all 22 types of amino acids. Among these, nine are deemed essential as the body cannot synthesize them independently. Milk proteins encompass all nine essential amino acids, whereas most plant-based proteins lack certain essential amino acids, rendering them incomplete sources.

The quality of a protein is evaluated based on its absorption and utilization within the body. According to the Protein Digestibility Corrected Amino Acid Score (PDCAAS), milk whey proteins score exceptionally high at 121, followed by eggs at 118 and soy at 91. Whey proteins in milk, are particularly rich in branched-chain amino acids, which are instrumental in muscle development. They are easily digested and absorbed by the body, making them an efficient source of protein.

Milk proteins also serve as a primary source of biologically active peptides. These peptides play crucial roles in the body, acting as regulatory compounds with hormone-like activities and possessing various therapeutic properties. Thus, the consumption of milk proteins can offer multiple health benefits beyond basic nutrition.

Dairy is not sustainable

We are living in an ecosystem with plants and animals and our existence is interdependent. Carbon footprint of producing almond or water consumption of growing paddy is much more than milk, still India is blamed for large number of animals producing methane.

It's important to recognize that while India is often criticized for the methane emissions from its large population of animals, the reality is more nuanced. The majority of our animals are sustainably fed on agricultural crop residues, minimizing the need for additional land for fodder production. Additionally, Dung/Gobar is being utilized in various environmentally friendly ways, including the production of natural gas, biofuel, and biofertilizer. Moreover, there is a long-standing tradition of preparing dried cakes from animal dung, which are commonly used as fuel in households, further exemplifying our resourcefulness and sustainability practices within the agricultural sector.

Milk is not good source of calcium

Milk is an excellent source of calcium, vitamins and other micro nutrients need by your body. The calcium from milk has maximum absorption and that is further enhance by presence of vitamin D and presence of lactic acid when it is fermented. Calcium from plants and supplements have very limited absorption in body and most of it excreted.

United Nation’s sustainable development goals for reduction of hunger and nutrition security are focused towards “healthy diets at affordable price’ (FAO, 2020) and we believe that “milk is the healthiest and the cheapest readily available diet” befitting to achieve this goal. Milk is food for all and a livelihood for millions of milk producers. Milk does not kill any animal or its progeny, hence, we consider it as a vegetarian food.

The Author

The author is **Dr. J.B. Prajapati**, Chairman, IDA (WZ). He is a Dairy Technology Graduate from Anand and Ph.D. (Dairy Microbiology) from NDRI, Karnal. With a wealth of experience spanning 45 years, he has been extensively involved in teaching, research, and industry collaborations. His illustrious career includes serving as the Dean of the Faculty of Dairy Science at AAU, Anand, and later assuming the role of Chairman at the Verghese Kurien Centre of Excellence at IRMA, Anand, for a period of three years. He has actively contributed to the development of skilled manpower for the Dairy Sector.

