

# **A View on Global Sustainable Dairy Products**

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# Introduction

Dairy products are generally defined as foodstuffs produced from milk. They are usually high energy yielding food products. A production plant for such processing is called a dairy. Dairy products are universally known for their nutritional and therapeutic values. The global milk production is showing an increasing trend. India, continues to be the world leader in milk production by producing 77 million tones out of 571 million tones of milk produced in the country, 54% is utilized for the conversion of different milk products (2000).

# **Importance of dairy products**

**Dairy products are likely to remain important dietary components because of their nutritive value, flavour and texture. There will continue to be a demand for traditional, high-quality dairy products, despite increasing competition from non-dairy based products or non milk alternatives still be the best source of nutrition for the young and for traditional dairy products.**

**Table: Nutritive value of milk and milk products per 100 g**

<i>Food</i>	<i>Moisture</i>	<i>Energy</i>	<i>Protein</i>	<i>Fat</i>	<i>Carbo- hydrates</i>	<i>Calcium</i>	<i>Phos- phorus</i>	<i>Iron</i>	<i>Vitamin A IU</i>
	<i>g</i>	<i>kcal</i>	<i>g</i>	<i>g</i>	<i>g</i>	<i>mg</i>	<i>mg</i>	<i>mg</i>	
Buffalo's milk	81.0	117	4.3	6.5	5.0	210	130	0.2	160
Cow's milk	87.5	67	3.2	4.1	4.4	120	90	0.2	174*
Human milk	88.0	65	1.1	3.4	7.4	28	11	–	137
Curds (cow's milk)	89.1	60	3.1	4.0	3.0	149	93	0.2	102
Cottage Cheese (channa) (cow's milk)	57.1	265	18.3	20.8	1.2	208	138	–	366
Cheese	40.3	348	24.1	25.1	6.3	790	520	2.1	273
Khoa (Whole buffalo milk)	30.6	421	14.6	31.2	20.5	650	420	5.8	497
Skimmed milk powder (cow's milk)	4.1	357	38.0	0.1	51.0	1370	1000	1.4	0
Whole milk powder	3.5	496	25.8	26.7	38.0	950	730	0.6	1400

Source: Gopalan C. (1991)

# Globalization

Broadly the term means integration of economics and societies through cross country flows of information, ideas, technologies, goods, services, capital, finance and people.

At consumer level

At farm level

Globalization

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graph TD; G[Globalization] --> C[At consumer level]; G --> F[At farm level]; G --> T[At Technology level]; G --> A[At Animal Husbandry sector];
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At Technology level

At Animal Husbandry sector

# Dairy Technology

Comprises all methods of handling milk from production to consumption. It includes processing, packaging, storage, transport and physical distribution. The objectives being to prevent spoilage, improve quality, increase shelf life, and make milk palatable and safe for human consumption has been defined as that branch of dairy science, which deals with the processing of milk and manufacture of milk products on industrial scale.

# Globalization at farm level

Increased productivity flowing from improved skills is the real answer. Firstly, dairy farmers could threaten to sell their products elsewhere, as interest grew and globalization finally reached the sector that for a long time was organized regionally and become an industry of multinational corporations, stock prices and commodities markets, milk was in demand and market forces were prevailing. Prices for milk and other dairy products skyrocketed. Many people consider children have access to an affordable glass of milk as a constitutional right.

# Globalization at Animal Husbandry sector

- Achieving sustained enhancement in animal productivity with most efficient use of natural resources, ensuring equity in research benefits to poor farmers.
- Major importance has been attached to clearly targeted selection and breeding of cows and their feed.
- The animal husbandry sector in association with the agriculture sector has to go much beyond its basic objective of providing food security, since these sectors are undergoing tremendous and significant changes worldwide upon globalization, technological development and growing emphasis on value addition.
- So improving livestock production alongwith increasing crop production is needed.



# **Globalization at Technology level**

**Advanced Technologies for dairy processing presents the latest developments concerning the quality, analysis and processing of dairy and dairy products. The availability of relatively simple technological advances, such as;**

- refrigeration,**
- large-scale transport by road and sea**
- high-speed routine business communication and**
- wide-ranging and complex warehousing and distribution system's**

**This has resulted in increased globalization, technological complexity, standardized milk quality, and lower product prices. The consumption of dairy and dairy-based foods has increased and industry has provided consumers in most socioeconomic groups with high-quality nutritious foods.**

# Globalization at Consumer level

- Consumers concerns will of overriding importance for the industry, and the safety of dairy foods must become absolute.
- At the same time, increasing attention will be paid by the consumer, producer, manufacture to safety and quality issues.
- Recent advances in the chemical, physical and information sciences and technologies will be utilized to gain greater understanding of the increasingly complex food systems and to support consumer objectives.
- Quality assurance and value addition of milk products might become a guiding force in future for consumers.

# Traditional milk products

The traditional Indian milk products are the products of masses being made in India since time immemorial. These products have great social, religious, cultural, medicinal and economic importance. It is estimated that more than half of the total milk produced in India is utilized for the manufacture of traditional milk products. (Banerjee, 1997). **The milk products like ; ice-cream, kulfi, butter, curd, paneer, rasogolla, khoa and its sweets are extensively used.**

The traditional milk products provide the means for preserving precious milk solids for a comparatively longer time than the fluid milk whose shelf life under Indian tropical land is only 5-6 hours at ambient temperature.

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- **Conventional methods of manufacture of traditional milk products are very simple.**
- **Do not require complicated and expensive equipment**
- **Can be adopted at rural collection centers.**
- **Reduce the transportation, operating and overhead costs.**
- **Generates lot of employment.**
- **Traditional milk sweets have a distinct advantage in that they are value added products.**

# Some inherent problems

- **Wide variations in chemical, microbial and sensory qualities from batch to batch.**
- **Small scale batch processes unsuitable for commercial adoption.**
- **Low heat transfer coefficients causing equipment to be bulky.**
- **In sanitary operations as these are open to atmosphere.**
- **Excessive strain and fatigue on the operators.**
- **Poor packaging.**
- **Limited shelf life of the products.**

# **Advancements towards traditional dairy products**

**The technologies of many traditional long-life convenience dairy products namely khoa powder, gulabjamun mix powder, rasogolla mix powder and dried kulfimix, have been developed in our country because these after several benefits, some of these are –**

- Long shelf life at ambient temperature.**
- Economic use of seasonal and regional milk surpluses.**
- Produce sweets of consistent quality at the convenience of users.**
- Adaptable to medium and industrial scale dairy processing operation.**
- Allow product diversification with manageable investments for improved productivity of the dairy industry.**

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**The main thrust in research priorities for next decades is likely to include:**

- **Raw milk quality improvement.**
- **Increased processing efficiency with a reduced environmental effect.**
- **Utilization of milk components for value addition.**
- **Development of health oriented foods.**
- **Rapid detection of high-risk m.o.**

# Development of Health Oriented Foods

**Functional foods** : contribute bioactive components to human diet, play role in prevention and treatment of diseases and improving body functions. Milk and its products are an excellent source of vital nutrients and functional constituents.

**Probiotics** : may defined as a food or supplement containing concentrates or defined strains of living m.o. that an ingestion in certain doses exert health benefits beyond inherent basic nutrition. Milk is an excellent medium to carry or generate live and active cultured dairy products.



# **Fat replacement in dairy products**

**High fat consumption has been linked to several chronic diseases including CVD and obesity.**

**Substances whose physical or thermal properties resembles fat are termed as fat substitutes and can replace fat on gram for gram basis and can also be used for frying application low fat cheese, processed cheese, cultured products, from desserts, butters and spreads have been successfully developed using commercially available fat mimics/replacers.**

# **Milk as tablets and compressed milk products**

**It is necessary to focus an areas, which will become predominant like neutraceutical, convenience, hygiene, safety and price etc. Milk in tablets and compressed form offers certain advantages in terms of their portability, convenience to use, easy handling, requires no refrigeration etc. These products may find good market in places of scarcity (Verma and Kanawjia, 2001).**

# **Rapid detection of High Risk Pathogen**

**There is a need to develop cost effective, reliable and simple ready to use kits for rapid detection of high risk pathogens at field level. Developments of such ready to use fruits and their subsequent introduction in dairy industry deserve immediate attention and top priority so that dairy products could be quickly monitored on routine basis right from production of milk to consumption of the end products**

# Packaging of milk and milk products

- **Packaging is the technique of using the most appropriate containers and components to protect, carry, identify and merchandise any product.**
- **It constitutes a vital link between the manufacture and eventual consumer for the safe delivery of the product through the various stages of manufacture, storage, transport, distribution and marketing.**
- **Milk should be delivered in fresh, sound and convenient form to the consumer.**
- **Packaging means placing a commodity in to a protective wrapper or container for storage and transport.**

# Future aspects

**The main thrust in research priorities for next decades is likely to include:**

- **Raw milk quality improvement.**
- **Increased processing efficiency with a reduce environmental effect.**
- **Utilization of milk components for value addition.**
- **Development of health oriented foods.**
- **Rapid detection of high risk microorganism.**



Thanks