

Milk in India

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It is said that the best government is that which governs the least. It could not be more true than, in case of all food products particularly Milk and Milk products. For all industrial goods, the Quality and Safety of the product is ideally built in to the 'System'. And the system itself should ensure best safety and quality practices with minimum surveillance and administrative intervention.

In a humble way I seek your indulgence to consider this submission on "Milk in India" and with its added social dimensions.

India's Natural Milk Advantage

1. Live stock population

India has the largest livestock population in the world.

2. Potential for very high demand of Milk

Milk enjoys traditionally very high USP among Indian masses because India is predominantly a vegetarian nation. According to FAO study Indian while availability of milk is 232 MI, but the consumption of liquid milk is only 100 MI per capita.

Depending upon availability and affordability of Milk, India's per capita milk consumption can go up many times higher. This represents the great potential strength of India's economy and domestic milk market to build upon.

Milk production enhancement offers the fastest and most economical way to improve nation's GDP.

3. Cow Milk has Great Social Significance in India and based on scientific reasons, would easily justify a higher price than any other milk.

3.1 BCM7 Free A2 Milk- the 'good' milk

Bos Indicus Cows, the native Indian breeds of cows represent the world's largest potential source of 'good' A2 type BCM7 free (Beta Casomorphine 7) milk for the world. While in short term dairy experts the world over may ostensibly choose to ignore or question the New Zealand research hypothesis on quality of milk, but it can not be denied that there is overwhelming medical evidence weighted in favor of BCM7 free A2 milk.

The current market price of A2 milk (milk of Indian breeds of cows) in Australia is Rs28 per liter as compared to Rs11 per liter for A1 commonly made available dairy milk

It will be very short sighted on the part of Indian Milk planners to continue to ignore this natural commercial and social advantage with Milk of Indian breeds of cows. The practical wisdom of Dairy farmers the world over, is motivating them to quietly convert their entire herd to A2 milk producing herds. The cross breeding policies that were being followed for the cattle in the last fifty years are being reviewed in light of this A1-A2 milk hypothesis.

US experts have already begun talking about a ten years plan to modify genetically their Holstein Fresian breeds in to A2 milk producing breed, by replacing amino acid Histidine with Proline at the 67th position of DNA.

Let not our Indian planners be led on the garden path of world milk bodies raising doubts about A2 milk theory. We should also be aware that quietly every Dairy nation is planning a change in its herd breeding policies. It is only a matter of time (say ten years) when India will be suddenly presented with a very large A2 milk production all over the world.

3.2 Desirable unsaturated fats are in Cow milk

Researches at NDRI have shown that Cow's milk has higher proportion of desirable unsaturated fatty acids (Omega3 & CLA) than Buffalo's milk.

For vegetarians ie majority of Indian people, Cow's milk is the most ecologically viable natural source of good fatty acid Omega3 in human diets.(Discovery about greater significance of Omega3 in human nutrition is just about a few years old.) Omega3 incidentally is the only natural source from which human body makes DHA (Decosa Hexaenoic Acid) and EPA (Ecosa Pentaenoic Acid) which not only are said to constitute 70% of human brain but also ensure good eye sights, and energy for the nervous systems.

Along with milk from green fed cows, fish being the other source of natural Omega3. Herein lies the secret that Indians who were over the millennia brought up on these two dietary elements viz. Cow milk and fish. (for those living near water bodies), and are still acknowledged to have the best brains in the world.

Other Omega3 sources are Flax seeds and Chia seeds. But unlike milk or fish in diets, these seeds can not be expected to meet Omega 3 requirements of an entire community.

3.3 Cow milk has 'Vitamin D' advantage.

Cow is called *dubhakta* lover of sunshine in Vedas, as against buffalo which can hardly stand sunshine. Thus there is no Vitamin D in buffalo milk.

(Vitamin D Miracles) - quoted from internet

Sunlight and vitamin D are critical to all life forms. Standard textbooks state that the principal function of vitamin D is to promote calcium absorption in the gut and calcium transfer across cell membranes, thus contributing to strong bones and a calm, contented nervous system. It is also well recognized that vitamin D aids in the absorption of magnesium, iron and zinc.

Vitamin D also enhances the uptake of toxic metals like lead, cadmium, aluminum and strontium if calcium, magnesium and phosphorus are not present in adequate amounts.

Receptors for vitamin D are found in most of the cells in the body and research during the 1980s suggested that vitamin D contributed to a healthy immune system, promoted muscle strength, regulated the maturation process and contributed to hormone production.

During the last ten years, researchers have made a number of exciting discoveries about vitamin D. They have ascertained, for example, that vitamin D is an antioxidant that is a more effective antioxidant than vitamin E in reducing lipid peroxidation and increasing enzymes that protect against oxidation.

Vitamin D deficiency decreases biosynthesis and release of insulin. Glucose intolerance has been inversely associated with the concentration of vitamin D in the blood. Thus, vitamin D may protect against both Type I and Type II diabetes.

The risk of senile cataract and Macular degeneration with age is reduced in persons with optimal levels of D and carotenoids.

Vitamin D plays a role in regulation of both the "infectious" immune system and the "inflammatory" immune system.

Low vitamin D is associated with several autoimmune diseases including multiple sclerosis, Sjogren's Syndrome, rheumatoid arthritis, thyroiditis and Crohn's disease.

Osteoporosis is strongly associated with low vitamin D. Postmenopausal women with osteoporosis respond favorably (and rapidly) to higher levels of D plus calcium and magnesium.

Vitamin D deficiency has been mistaken for fibromyalgia, chronic fatigue or peripheral neuropathy.

Infertility is associated with low vitamin D. Vitamin D supports production of estrogen in men and women. PMS has been completely reversed by addition of calcium, magnesium and vitamin D. Menstrual migraine is associated with low levels of vitamin D and calcium.

Breast, prostate, skin and colon cancer have a strong association with low levels of D and lack of sunlight.

Activated vitamin D in the adrenal gland regulates tyrosine hydroxylase, the rate limiting enzyme necessary for the production of dopamine, epinephrine and norepinephrine. Low D may contribute to chronic fatigue and depression.

People with Parkinsons and Alzheimers have been found to have lower levels of vitamin D.

Low levels of D, and perhaps calcium, in a pregnant mother and later in the child may be the contributing cause of "crooked teeth" and myopia. When these conditions are found in succeeding generations it means the genetics require higher levels of one or both nutrients to optimize health.

Behavior and learning disorders respond well to D and/or calcium combined with an adequate diet and trace minerals.

Vitamin D and Heart Disease

Research suggests that low levels of vitamin D may contribute to or be a cause of syndrome X with associated hypertension, obesity, diabetes and heart disease. Vitamin D regulates vitamin-D-binding proteins and some calcium-binding proteins, which are responsible for carrying calcium to the "right location" and protecting cells from damage by free calcium. Thus, high dietary levels of calcium, when D is insufficient, may contribute to calcification of the arteries, joints, kidney and perhaps even the brain.

Many researchers have postulated that vitamin D deficiency leads to the deposition of calcium in the arteries and hence atherosclerosis,

noting that northern countries have higher levels of cardiovascular disease and that more heart attacks occur in winter months.

Scottish researchers found that calcium levels in the hair inversely correlated with arterial calcium-the more calcium or plaque in the arteries, the less calcium in the hair. Ninety percent of men experiencing myocardial infarction had low hair calcium. When vitamin D was administered, the amount of calcium in the beard went up and this rise continued as long as vitamin D was consumed. Almost immediately after stopping supplementation, however, beard calcium fell to pre-supplement levels.

Administration of dietary vitamin D or UV-B treatment has been shown to lower blood pressure, restore insulin sensitivity and lower cholesterol.

The Right Fats

The assimilation and utilization of vitamin D is influenced by the kinds of fats we consume. Increasing levels of both polyunsaturated and monounsaturated fatty acids in the diet decrease the binding of vitamin D to D-binding proteins. Saturated fats, the kind found in butter, tallow and coconut oil, do not have this effect. Nor do the omega-3 fats. D-binding proteins are key to local and peripheral actions of vitamin D. This is an important consideration as Americans have dramatically increased their intake of polyunsaturated oils (from commercial vegetable oils) and monounsaturated oils (from olive oil and canola oil) and decreased their intake of saturated fats over the past 100 years.

In traditional diets, saturated fats supplied varying amounts of vitamin D. Thus, both reduction of saturated fats and increase of polyunsaturated and monounsaturated fats contribute to the current widespread D deficiency.

Trans fatty acids, found in margarine and shortenings used in most commercial baked goods, should always be avoided. There is evidence that these fats can interfere with the enzyme systems the body uses to convert vitamin D in the liver.)

3.4 Cow milk has also the advantage of Beta Carotene.

Beta Carotene is known to perform following important functions:

1. Protects human body cells from damage by free radicals.
2. Provides a natural source for Vitamin A

3. Enhances functioning of Immune System.
 4. Help in maintaining proper functioning of Reproductive System.
- These above enumerated advantages of Cow's Milk over Buffalo milk can not be ignored in interest of community health by any body.**

4.Total Fats in Milk

Nutrition Science concurs with medical researches that most of the fats in milk are found harmful for human health.

Typical Milk consists of 70% Saturated Fatty Acids, 25% MUFA (Monounsaturated Fatty Acids) and only 5% PUFA (Polyunsaturated Fatty Acids). Ideally Milk could have contained 8% FA,82% MUFA and 10% PUFA. Most of the additional fats in buffalo milk consist of only saturated fats. Death rates in human population due to CHD (Cardiac Heart Disease) are directly related to saturated fats consumed in human diets.

World milk authorities are already seized of this situation. Multicountry European research project Lipgene is already aiming to obtain a better fat composition in milk of European cattle.

4.1 Good Milk Concept

It has been confirmed in USA at NIH level that Milk rich only in unsaturated fatty acids Omega3 and CLAs (Conjugated linoleic acids) is the best preventive against all self degenerating human diseases. Accordingly Milk rich in Omega3 and CLA is considered "Good" Milk the world over.

4.2 Total Fat in Milk in Ancient Times

In Atharv Veda chapter 12, 4th Hymn, it is indicated that cows having high fat content in their milk were not to be kept for domestic milk consumption, because such milk was harmful to the family. It was suggested that such cows may be raised by Brahmins (more intelligent persons/priestly class), who could make ghee out of the milk fat for use in agnihotra offerings. Kautilya's Arth Shastra in 2-25-45-29 describes from administration considerations, the norms prevailing for fat content in milk of Cows, Buffaloes and Goats. Cow it appears was expected to have about 0.625% fat in milk, and buffalo 5 times higher ie 3.125% fat in milk , Goat milk two times higher than cow milk i.e. 1.29% fat.

It is a moot point if over the millennia by domestication and change of feed patterns and pastures to stall feeding, we have brought upon ourselves the genetic transformations in cattle to the present higher

fat composition of milk. Modern efforts by Lippene in EU, are already showing some success in getting low fat natural milk from cattle.

5. Milk Pricing in India

It is also high time that Indian Milk quality guide lines talk not of total fat contents of milk but of good fat contents of milk viz. Omega3 and CLA contents of Milk.

Diagnostic Kits for quick determination of Unsaturated Fatty Acids in Milk can be developed with the present state of Biotechnology and Biochemistry expertise. In fact Iodine test shows only the unsaturated fats and can be used to indicate the proportion of unsaturated fats in milk.

The concept of paying higher prices for Buffaloes' milk based on total fat content is an outdated concept coming from the period when modern science had not discovered the significance and role of unsaturated fatty acids in human health.

Higher Total fat content in buffaloes' milk in light of the modern researches would no longer justify the higher price paid for Buffalo Milk, The advantages in cow's milk of higher proportion of unsaturated fatty acids in total fats, overwhelming advantage of Vitamin D , Iodine, Beta-Carotene, and iron, justify a higher price for Cow's Milk in interest of community health.

It is submitted therefore that if not higher at least , uniform prices should be paid for all milk i.e. cow, buffalo, goat, sheep etc. It would also be desirable to market cow, buffalo and goat milk separately, without mixing them. There are consumer preferences on more than one consideration to prefer only cow or goat milk over other milks. Such consumers will be also willing to pay higher prices for the milk of their choice.

Premium prices should be paid only for good milk ie milk rich in PUFA and MUFA, ie Omega3 and CLA, and not on total fat contents of milk, as is the practice in India. It bears repetition that bulk saturated fat contents of milk are found to be unhealthy in human diet. So there is hardly any sense in promoting high fat content milk by paying higher prices for the disease promoting milk in the interest of public health.

In promoting buffalo milk our Dairy planners are also knowingly ignoring the higher unsanitary conditions associated with buffalo upkeep and buffalo milk.

6. Supply Chain Consideration.

It is an environmental cliché that our food supply chain should be the shortest. But for a warm country like India, the short food supply chain has a far greater significance. Shorter Milk supply chain requires lesser interventions to increase the shelf life. This means lesser role of additives and preservatives in milk and milk products. Ideally a household cow in rural and periurban areas is the ideal and involves the shortest milk supply chain.

Such an approach to milk will considerably minimize the milk quality monitoring infrastructure and expense. The final test of good milk quality is only taste and smell by the consumer of Taste and Smell. . No laboratory test can be better and cheaper than final cost free test of Taste and Smell by consumer.

7. Export potential of our Milk

7.1 Role of FSSAI

The organized Dairy Industry on its own admission caters to only 15% of India's milk demand. It is therefore logical that a central authority like the FSSAI ought to concern itself with the larger responsibility of addressing the entire nation's milk situation, rather than just 15% of Dairy milk, which is a small fraction of the total.

7.2 International milk standards/codes

Over emphasis on the international codes and standards become applicable only when there is scope and objectives connected with India making a big bid to enter global milk market. India has the world's oldest milk consuming society, and there is precious little that we have to learn from the western nations about milk and strategies that India should follow in managing its Milk production and consumption. India's climate, local situations and public traditions need only India specific strategies. Let us be realistic so long as we have a tremendous domestic demand for milk the talk of exports of milk on any large scale may not be feasible.

Secondly with 'Buffalo' milk in our 'pail', there will not be many unhesitant foreign buyers of Indian milk and milk products.

8. Enhancing Health and Milk yield of Indian Cattle.

Our Practical Demonstration of 20% Growth

8.1 Pre Partum/post partum care

It is now universally acknowledged and demonstrated in practice that through better pre- partum post- partum and planned management of

cattle, remarkable improvements in milk yield are possible even in the local breeds of Indian cows. This is one area that needs far greater emphasis in our veterinary extension work.

Starting with a herd of about a dozen cows nearly 17 years ago, inaugurated with the blessings of the Prime minister Indira ji and nurtured by the then Agriculture Minister Shri Balram Jakhar ji, MDGSK (Maharishi Dayanad Gosamwardhan Kendra) in East Delhi, to day has a herd strength over 450. Milk yield peak touched 1150 liters in a month this year.

This institution can be seen to have recorded better than 20% year on year cumulative growth in herd strength and milk production and is a self sustaining Goshala model in Delhi.

This has been achieved without resorting to AI, and Cross Breeding with European cattle, only with Indian breeds of Cows. This only shows that 4 to 5% increase in Milk production figures projected in our country are far below the potentials achievable. It is hoped that this endeavor can offer subject for a close case study of a sustainable stand alone NGO effort.

9. Enhancement of Green fodder availability

GREEN FODDER IS THE NATURAL FEED FOR CATTLE

Even USA has resolved to promote green fodder enhancement strategies in USA. Only green feed based Cow's milk is the best for human nutrition, as explained above in 4.2.

Following three areas are being explored by us in MDGSK in Delhi, in the prevailing current situation in India

1. To suit the local Indian conditions development of cost effective Hydroponics Fodder devices
2. Development of perennial leaf fodder trees.
3. Marine Algae as supplementary green fodder.

Animal husbandry Department can ill afford to put the entire responsibility for health and good nutrition of the nation as concern and jurisdiction of Health Ministry.