HEALTH SIGNIFICANCE OF A2 MILK OF INDIAN NATIVE COW

INTRODUCTION:

The Bos Indicus cow is the *desi* breed that produces the A2 milk with the good quality protein but it has been conveniently replaced by the high-yielding cross breed, popularly known as HF or Holstein Friesian in India which provides the A1 variety of milk. This is something we need to consider beyond the 'type' of milk.

Let's briefly rewind the past history. It all began in 1970 when Operation Flood was launched by the National Dairy Development board which transformed India from a milk deficient nation into the largest milk producer in the world. The mission of the project was three-fold - increase production, boost rural production and offer fair prices to consumers. "The sad reality of the white revolution was that it led to cross-breeding with European cows and import of foreign hybrid breeds for higher yield in order to meet the goal of mass production. This has brought us to a situation today where the *desi* cow has become a dying breed in India. Imagine this - the Gir cow, which is a Gujarati breed, is now being imported from Brazil and the Brahmi Bull, which is another pure breed, is more popular in Australia. It's ironic that people in these countries are drinking better quality milk from cows, native to our country.

Most important nutritional trait milk constituents include fat, protein, SNF (Solids Not Fat (SNF) consists of everything except milk fat and water. That means total solids content in the entire residue left after complete evaporation of water from milk. This includes fat protein, lactose and mineral matter. Normally cow milk contains 8.5% SNF whereas buffalo milk contains 9.0% SNF), lactose and ash. Being rich in these components, milk is considered as one of the essential foods all over the world. Amongst the milk constituents, β-casein has gained importance and popularity in the health-conscious people. The status of A1 or A2 beta casein variants in Bos taurus cattle breeds from different countries have been shown that the presence of A1 variant in European cattle which has been linked to a range of illness. Our indigenous dairy animals (known as Bos Indicus) produce milk containing A2 variant and India is endowed with A2 rich dairy animals since our civilizations, protecting the masses from ill effects of A1 milk. But Cross breeding program has been declining the availability of A2 milk in India. It is a matter of great concern for the public health. There is a need to crosscheck our breeding policies, so that the purity of desi breeds and their beneficial qualities can be conserved.

Facts About A2 Milk:

Recently milk has been accused of being laden with antibiotics and stress hormones. One has also heard about milk and how it is affecting our health.

Our country which is predominately vegetarian, milk is a very important nutrient and a good source of protein and calcium and is necessary for one's growth.

Milk is 87-88% water and 12-13% solid which includes lactose or sugar / fat/ protein/ minerals. 80% of milk protein is casein, 30-35% beta-casein which is further divided into A1 and A2.

Milk containing A1 beta-casein at the time of digestion releases BCM-7 in the small intestine which is not well absorbed by the body and one may feel bloated or uncomfortable. It also has an effect on one's immune system, type 1 diabetes, heart disease etc.

Whereas, Milk consumed with A2 beta-casein also produces amino acid called proline which prevents the formation of BCM-7. Resulting in better digestion. Taste and also rich in omega 2 fatty acids, vitamin A which is good for eyesight and strong immune system. Regular consumption also increases HDL (good cholesterol).

Indian native breeds of indigenous cows and buffalo with a hump on their back and long horns are considered rich in A2 beta-casein milk protein. Whereas humpless breeds or crossbreed produce more A1 milk which produces amino acid called Histidine allowing the formation of BCM – 7 and its ill-effects on human health.

Also, players and policy makers should not just alone promote A2 milk, they should also promote lactose-free, high protein, high calcium milk, non-adulterated or antibiotic free or organic milk.

Beliefs :

Studies by the National Bureau of Animal Genetic Resources (NBAGR), Karnal covering 22 *desi* breeds have established that predominant genotype in India's native cattle is A2 , confirming that our indigenous cows and buffaloes produce A2 milk.

The frequency of A2 allele was 100 per cent in the five high-yielding milk breeds — Red Sindhi, Gir, Rathi, Shahiwal and Tharparkar, meaning that these breeds do not have A1 allele or A1A1/A1A2 genotype. In the remaining breeds, the availability of A2 allele was 94 per cent.

NBAGR also reported moderate to high frequency of A2 allele among the breeding bulls, further supporting the belief that milk being sold in India is safe for human consumption.

Comparatively, in the exotic breeds like Jersey and Holstein Friesian, the availability of A2 allele is very low.

Considering the widespread use of exotic types in Indian cross-breeding programmes and the fact that these exotic breeds are source for A1 allele, there is need for caution in future breeding activities to ensure that A1 allele does not get fixed in Indian cattle breeds.

NBAGR is currently implementing a project entitled "Delineating Beta Casein Variants in Indian Cows and Potential Health Implications of A1 A2 Milk". The bureau is also offering a service for genotyping of A1/A2 allele from milk or blood samples in cattle species at nominal cost. Private companies in India have also ventured into this by offering allele detection kits.

Indian Cows In Brazil :

India is the leading milk-producing country in the world, accounting for 20 per cent of the global market share where dairying is considered a major source of livelihood for farmers particularly in the times of agrarian distress. On the other hand, Brazil has had an average growth of 7 per cent in world milk production, which has led the country to occupy the fifth position in terms of volume. Maharaja of Bhavnagar, Gujarat,

Krishna Kumarsinhji Bhavsinhji and first Indian Governor of Madras was instrumental in changing the fortunes of the Brazilian dairy industry.

In the 18th century, Maharaja gifted a `Gir' cattle pair to Celso Garcia Cid, an icon in the history of Brazilian livestock and successful entrepreneur. This breed is famous for its down horns and reddish-white coat. The bull gifted was named `Krishna', after one of the most popular Hindu gods worshipped in India.

When Krishna was brought to Brazil in 1960, it started a genetic revolution that made `Gir' one of the most valued breeds in the bovine embryo market and spawned a mixed breed. It is estimated that 80 per cent of Brazilian `Gir' cattle carry genes from the `Krishna' bull that is now referred to as `Gyr'. The `Gyr' was subsequently crossbred with Holstein, a Dutch variety, to create the hybrid 'Girolando'. This breed grew rapidly across Brazil and contributed to about 80 per cent of the nation's milk production and was registered officially in 1989 by Brazil's agriculture ministry.

Gir cows which brought a white revolution in Brazil, has over the years, become a high milk-yielding breed and is quite popular in South American countries due to its ability to survive in extreme weather and tropical diseases.

Brazil now has about 40 lakh heads of `Gir' cattle and a well-cared-for `Gir' cow is capable of yielding an average of 30 to 40 litres of milk a day, and this can even go up to 60 to 70 litres. This huge amount of milk contributes to the Brazilian economy.

In recognition of the Gir's role in the country's economy, it finds a place on Brazil's coins and in recognition of Maharaja Krishna Kumarsinhji Bhavsinhji's contribution to its dairy industry; the country has erected a statue of the late ruler near its Parliament House. Over time, this breed has now spread across the American continent and the Gir cow is one of the principals `Zebu' breeds of cattle that originated in India.

In 2016, India and Brazil signed MOU between the Department of Animal Husbandry, Dairying & Fisheries (DADF) and Brazilian Agriculture Research Corporation (EMBRAPA) on cooperation in the Fields of Zebu Cattle Genomics and Assisted Reproductive Technologies. The Brazilian government has agreed to set up an Indo-Brazil Centre of Excellence for Cattle and Sheep Breeding, research and development facility, at Nizamabad as part of the Gopal Gram scheme, where it will provide technical expertise and also train officials. The 'Gokul Gram' scheme works towards the conservation and development of native cattle breeds.

Indigenous V/S Cross Breed:

During the 1970's there was an open flood of exotic cows. Crossbred cows were in vogue for their higher milk yields. However, the quality of milk was not kept in mind. Some crucial points were missed: these cows are more susceptible to diseases. The hot, tropical climate of India doesn't suit them. The food is incompatible. Jersey and other crossbreds suffer from gas and diarrhea. They consume great amounts of fodder. As a result they are more expensive to maintain. Besides, they have a short lactation period, after which they are killed for meat. Apart from milk and meat, they make no other contribution.

With a little intelligent manipulation (by selecting the best pedigree) indigenous cows can attain equally high levels of milk production, as has been demonstrated by countries like Brazil and Argentina(which have been

importing and breeding Indian cows of pure breed).The best bulls of India, such as the legendary Brahmani bull can be found there. Following are certain differences between Indian and foreign breeds :

Sr. No.	Indigenous	Cross Breed
1	The hump is an exclusive characteristic of the Indian Desi bulls and cows and facilitates them to carry loads without effort.	While their exotic counterparts are endowed with straight backs that are not built for carrying loads.
2	The Indigenous Cattle have a high heat-resistance by virtue of their extensive Dewlaps below the ear.	It lacks in foreign counterparts.
3	The Indian oxen, with an enhanced “horsepower “, cover a 2 km distance in 18.2 minutes and proves their utility in the agricultural field.	The exotic ones have less horsepower and cover the two kilometers only in 19.4 minutes; besides, they are unable to work in the fields.
4	The expenditure on an Indian Desi cow is only about RS 4500 approximately.	Foreign cow that needs about RS 7500.
5	During its menstrual cycle, the split head of the estrus of an Indian cow is only about 0.7 %.	During its menstrual cycle , the foreign cows show 1.33%.
6	The Desi breeds have a higher immunity to diseases like Harpies, Parjivi, Thanaila, and the like; their susceptibility being only 24% and only about 9% to the Thilairia disease. Moreover, they contract diseases at a level of about 21%.	They have lower immunity to diseases which is pegged to around 72%.
7	The congenial atmosphere in India helps our cows to tolerate temperatures of 0.4 to 50 degrees centigrade, without any lowering of its milk output.	while the exotic cows not only wilt at high temperatures, but also see a drop in their milk output and contract diseases quickly.
8	The Desi domestic cows need no special shelter, and will gladly settle down near the dwellings. At high temperatures, their milk output reduces only by about 5-10%.	Foreign counterparts need special shelters in winter, when their lactation decreases as low as about 70-80%.
9	Greater immunity of the Desi cows to diseases, ensures that they remain healthy and do not fall sick regularly, saving their owners the travails of unnecessary expenditure, and recording an eighty to ninety percent survival. Their higher globulin and lower Creatinin levels help them naturally to stay healthy.	With an inadequate Globulin level and a higher level of Creatinin, the exotic cows are always susceptible to even the small diseases, bringing down their survival rate in the rural areas to as low as about 50%.
10	The Desi cows yield a special nutritional quality of milk containing some special active ingredients that keep diseases at bay.	Though the exotic cows yield more milk, they are less nutritious and contain a higher percentage of water.

11	The calves born to the Desi cows, if they are males, withstand the vagaries of the weather better, and become healthy, robust bullocks that perform a slew of useful activities like drawing water from an underground well, tilling the fields, transporting both produce and people to cities, and even servicing marriage events by chipping in on the transportation of guests. All these activities are now presumably done by tillers, buses and the like that add pollution by way of burning diesel.	On the other hand, both the calves, and when they grow up, the bullocks, of the exotic cows are lazy and do not suit the agricultural needs of the farmer.
12	There is evidence that the Desi cows leave oxygen in the atmosphere for the benefit of humans.	Such evidence is absent in respect of foreign cows.
13	By virtue of the fact that the indigenous cows show low vulnerability to tuberculosis, basil and similar diseases, it is safe for humans to interact closely with them without fear of contracting diseases.	Foreign cows, are vulnerable to diseases like laptospies, micoplasma, and the like,, and those having brusella, tuberculosis, etc., possibly pass it on to humans.
14	A combination of cow's milk, curd, ghee, urine and cow dung form the ingredients for the miraculous "Panchagavya" that is used in preparing diverse Ayurvedic medicines, suitable for treatment of a variety of chronic diseases.	The exotic cows are not endowed with providing medical utility products.
15	The Desi cows have a lot of benefits for us, like their milk, their calves and their precious urine and cow-dung that serve multifarious uses. They also do not require hormone inoculations like the poisonous Oxytoxin.	The foreign origin cows are raised exclusively for milk, and are inoculated with Oxytoxin, when their milk yield decreases. Such milk contains traces of these poisonous substances, and is not safe for human consumption.
16	The assortment of microscopic organisms that live in the cow dung of the indigenous cow function a probiotic protection against the harmful effects of the ultraviolet rays of the sun, and the local people convert the cow dung into flattened round cakes and paste them on the walls of their houses, to escape radiation.	There is no evidence of this in the case of the foreign cows.
17	People believe that, not only will diseases like tuberculosis in humans, disappear by virtue of sleeping in the vicinity of the Desi cows, but it also induces a sense of mental balance.	Sleeping near exotic breeds may risk your contracting diseases from them.
18	The odorless cow dung of the Desi cows is a result of their feeding on green grass, and hence ideal for medicinal applications.	The foreign cows eat grain for fodder and their odorous cow dung is devoid of medicinal properties.

19	Indigenous breed's cow dung is an excellent remedy against the cholera virus.	The dung of the exotic cows cannot boast of such benefits.
20	The indigenous cows remain healthy under difficult atmospheric conditions, without any adverse effects on their productivity, and the interesting fact is that they can conceive even under adverse environments and hostile weather.	The exotic breeds, on the other hand, cannot withstand adverse conditions, resulting in falling productivity, increasing mortality and difficulty in the process of conceiving.

Difference Between A2 Milk Of Cow And A2 Milk Of Buffalo :

Sr. No.	Cow Milk	Buffalo Milk
1	Lower in fat than buffalo milk; preserved for the fewer time.	100% a lot of fat content than cow's milk; will be preserved for extended.
2	Cow's milk is wealthy in a type of minerals, vitamins, and proteins; it's additionally a wonderful supply of calcium.	Buffalo milk is very wealthy in calcium, and maybe a sensible supply of minerals like magnesium, potassium, and phosphorus.
3	More cholesterol, less fat, fewer calories. it's helpful for healthy bones, dental health, reducing fatness in kids, protection from thyroid diseases, and cardiovascular health.	Less cholesterol, more fat, a lot of calories. it's smart for healthy bones, dental health, cardiovascular health, and weight gain.
4	Dairy products: curds, sweets, cheese – however less thick and creamy	Produces thick and creamy dairy farm product appropriate for the manufacture of ancient milk product like yoghurt and farm cheese (called "paneer" in South Asia), also as indigenous milk product like khoa and clarified butter.
5	Cow's milk is consumed everywhere the planet, as well as regions that additionally consume buffalo milk.	Buffalo milk is common in South Asia (India, Pakistan) and Italy.

Conclusion :

The Indian native cow will have Hump of the Shoulder, Long Ears and the Skin is hanging on the Neck. They have Suryaketu nerve on the back and it is believed that Suryaketu nerve absorbs medicinal essences from atmosphere and makes milk, urine and cow dung more nourishing. The ability to shake only a particular part of the body, for example it can shake only the skin the stomach area without shaking the other parts of the body. It can withstand the tough climatic conditions of this country, either hot, rain or cold. It delivers around 15 to 20 calves in her life span. It can walk for more kilometers and work hard accepting the climatic

conditions of this part of the world. A cow in its lifespan feeds thousands of people and one cow is sufficient to do natural farming in about 30 acres of land according to Padmasri Subhash Palekar system.

With a little intelligent manipulation (by selecting the best pedigree) indigenous cows can attain equally high levels of milk production, as has been demonstrated by countries like Brazil and Argentina(which have been importing and breeding Indian cows of pure breed).The best bulls of India, such as the legendary Brahmani bull can be found there.

The A2 milk (Desi cow's milk) should only be recommended as it prevents the human beings from milk related health complications, which are due to A1 milk (Exotic cattle's milk). In India, the exotic/crossbred milch cattle increased from 14.4 million to 19.42 million, an increase of 34.78 % (19th Livestock Census-2012). It's the nation's responsibility to cease cross breeding programmes and protect purity of desi breeds like Ongole, Gir, Tharparker, Hallikar, Kankrej, Deoni, Kangeyam, Nagpuri and Vechur.