

Importance of Milk in diet

Ms. Anshu Gupta (Wellness Manager-Nestle India Ltd.)

Milk is white nutritious secretion, produced by mammary glands of female mammals for feeding their young. It is one of the nature's most complete and nutritious food on planet. However, since ages, humans have been consuming milk of animals like cow and goats as it is highly nutritious and easily available in large quantity. Since milk is now a food product it has been well defined as per the Prevention of Food Adulteration acts (PFA). As per the PFA acts (A.11.01) it is defined as "Milk is the normal mammary secretion derived from complete milking of healthy milch animal without either addition thereto or extraction therefrom. It shall be free from colostrum."

A cup of milk provides a wealth of nutrients and this we can look from the fact that it is high in proteins, calcium and a range of minerals and vitamins. The nutritional status of milk proves the fact that milk contains all the food constituents required in the human diet and in essentially the proper proportions. Milk supplies proteins of exceedingly high quality and of a nature to supplement, especially well, proteins in the human diet from other sources. Milk also supplies liberal amounts of calcium, which is often otherwise deficient in the human diet. Along with calcium, milk also contains various nutrients that favour calcium absorption (lactose, protein, vitamin D).

Milk of different species, although containing the same constituents in general, varies in composition and properties in minor ways. The difference in the nutrient contents are also man made incorporated due to different processing and this has brought a variety of milk in the market. The original, unprocessed milk which contains fats in its original form is known as whole milk. When fat is removed from the milk and there is less than 0.1% fat, it is called skimmed milk; it has slightly more protein and calcium than whole milk. The fat-soluble vitamins are less than whole milk. Semi-skimmed milk is a low-fat milk with fat content <2% and like skimmed milk the protein, calcium and fat-soluble vitamins are in reduced amounts.

Milk contains approximately 3.5% protein by weight which can be divided into two main groups: caseins and whey proteins. Approximately 80% of the protein in milk is casein based and 20% is whey based. Milk protein is highly digestible and used efficiently, it is found to have high biological value and they contain all essential amino acids that the body cannot synthesize and in the right proportions. These facts have led scientists to conclude that milk proteins are among the most valuable proteins for man.

Other than being a good source of protein it also contains a special carbohydrate known as lactose. It is found only in milk and very few plants and thus it has derived its name which means 'MILK Sugar'. It is a disaccharide comprised of glucose plus galactose. Lactose along with fats is a major source of calories, lactose alone provides 30% of the total milk calories. Skimmed milk contains around 11-14g of lactose per 250ml of milk where as in whole milk and semi-skimmed milk the lactose content is less. Lactose is more preferred over sucrose as it has the lowest sweetness of all natural sugars. Lactose has relatively lower glycemic index as compared to glucose or sucrose and is suitable for diabetics. It is less cariogenic than other sugars, inhibiting tooth decay. Lactose has a beneficial influence on gut flora as it enhances the growth of bifidobacteria in the colon and thereby prevents infection and improves intestinal health. Bifidogenic activity of milk is ascribed to lactalbumin, lactoferrin and glycomacropeptide derived from the breakdown of casein during digestion. It also facilitates the absorption of calcium, magnesium and manganese. In infants, it helps in the net retention of phosphorus.

Fats in milk provide a unique characteristic to the flavour, texture, appearance and stability of the dairy products. Whole milk contains around 4 % fat of which 67% comprises of saturated fatty acids and 30% monounsaturated fatty acids, 3% polyunsaturated fatty acid and 3% trans fat. The trans fat content of milk is natural fat and studies have proved that they are not detrimental for heart health as in case of trans fat generated through hydrogenation of vegetable oils. The health oriented essential fatty acids such as omega-3 linoleic acid, eicosapentaenoic acid and docosahexaenoic acid are found in significant level in milk fat. Fatty acids of milk help to lower the pH which in turn facilitates protein digestion.

Milk is rich in mineral salts particularly calcium, which is vital in the development of the growing skeleton of the child. This is not the only reason of including milk in the diet of the child, particularly the infant. Infancy is characterized by rapid growth and development and the digestive system is still immature. Thus milk is provided to the infant as the constituents of milk are highly digestible, palatable and require little preparation. However, human milk is the best food for the child and breast feeding is exclusively recommended in the first six months as it supplies adequate nutrients in the right balance and is safe and rich in protective factors, leading to less gastrointestinal infections.

In preschool children i.e. children between 7-12 years, there is a slow but steady growth with an increase in appetite and food intake. This is an important time for building optimal bone mass and so calcium and other important milk nutrients are needed throughout childhood to maintain existing bone mass and for bone growth. Recent studies indicate that psychomotor development in children may be impaired in riboflavin deficiency and milk and milk products are a good source of riboflavin. Milk also helps in the prevention of pellagra. Although milk is poor in nicotinic acid, the deficiency of which may lead to pellagra, milk is efficient in preventing pellagra because it is rich in tryptophan. Tryptophan is convertible to nicotinic acid in the body.

The importance of milk consumption is felt continuously during all the stages of the life. During adolescence period there is rapid physical growth and maturation thus there is an increased demand for protein and other nutrients.

Adults often do not consume enough dairy foods, missing out on nutrients that are important for good bone health thereby predisposing themselves to the risk of osteoporosis in later stages of life. There is continuous demineralisation and mineralization taking place in bones and teeth, when the body is compromised in such nutrients which help in mineralization of bones and teeth; there is an increased risk of tooth decay and osteoporosis especially among post menopausal women. Adequate nutrient intake as part of a well balanced diet is important during old age too as this is a period of physiological stress associated with decline in bone mass and muscle mass and gain in adipose tissue. Also the rate of mobilisation of calcium is increased from the bones resulting in demineralisation and porosity, leading to osteoporosis.

Milk has large quantity of water as its constituent and thus is considered the best fluid for rehydration. It also maintains healthy skin health and so has found application in a number of cosmetic products. Regular consumption of low fat dairy products can help to reduce the risk of type 2

diabetes. Also people who consume milk and dairy foods are likely to be slimmer than those who do not which implicates its association with reduction of obesity. Consumption of milk and dairy foods as a part of a calorie controlled diet is associated with increased weight loss, particularly from the abdomen. Consuming 2 portions of dairy each day along with 5 portions of fruits and vegetables as part of a low salt diet can reduce high blood pressure in both adults and children. Milk is also found to have a protective effect on the risk of both colorectal and breast cancer. One can notice several health impacts of milk and dairy products.

India is the world's largest milk market with 12% share of global consumption. Indian per capita consumption is high with about 96 L per capita. Daily consumption of milk is found to be 2 - 2.5 liters per affluent Urban Indian household.

Milk should find place in any balanced diet, particularly in a vegetarian diet, to provide good quality protein; sufficient calcium and riboflavin which are difficult to obtain in adequate quantities solely from plant foods. An adult diet should have at least 150ml of milk a day while children, pregnant and lactating women should receive at least 250ml milk a day.

Prepared by **Ms. Ummeayman R.** (Nutritionist, PFNDAI) based on the presentation by at Nutrition Week Activity 2009 at UICT
