Yoghurt - A Health and Nutrition Food for all Ages

H.C.S. Peiris
ISO Consultant

Youghurt is now a popular milk product in Sri Lanka and is gaining popularity. In the late 19th century and early 20th century. The average life span of a man was about 30 years or less compared to about 75 years at present. A study carried out by the Nobel prize Laureate Elie Matchinicoff a Russian Zoologist and Microbiologist observed a tribe living in bulgaria with a life span exceeding hundred years. He attributed the longevity of the Bulkan People to the consumption of lactic acid forming lactobacillus bacteria and named the particular bacteria as lactobacillus bulgaricus in recognition of the country in which it was discovered. In Sri Lanka recommended culture at present for youghurt is a combination of lactobacillus bulgaricus and streptococcus thermophillus. Use of these traditional youghurt cultures and probiotic bacteria has numerous health benefits. Many researchers have contributed to the unravelling of numerous health benifis of Lactobacillus and Bifido bacteria on human beings.

Youghurt is a fermented milk product made using lactobacilus or Bfido bacteria cultures. Bifido bacteria were discovered in 1899 by Tissier at the Pasteur Institute Paris in France. Elie Metchnikoff (1845 - 1916) discovered amoeba like cells in animals that engulf foreign bodies such as bacteria, a phenomenon known as phagocytosis and a foundamental tenet of the science of immunology. He dovoted the last decade of his life to the study of lactic acid producing bacteria and observed them as a means of improved gastrointestinal environment increasing good health and longevity of human beings. He received the Nobel prize in 1908 for this work. Dr. Charles St. Geoge, etal of the National Milk Board in 1969 isolated Lactobacillus fermentum, a lactic acid producing Bacteria in curd Manufactured in the Southern Part of Sri Lanka. Food Technology Journal of IFT Ilinois USA Page 48 of 2001 March issue mention of this organism as a probiotic. I also had the privilege of associaling in this work. Different varieties of yoghurts could be produced, such as plain youghurt, sweetened yoghurt, sweetened and feavoured youghurt, fruit youghurt, frosen salad yoghurt, liquid yoghurt. Depending on the fat content, yoghurt is classified as non-fat, low fat and normal yoghurt.

Average percentage of plain yoghurt is 3.5% fat, 3.3% proteins, 4.7% Carbohydrate, Ash 0.7%, Calcium 0.12% , Phosphorus 0.10% and Sodium 0.05%, Different types of Lactobacillus or Bifido Bacteria are used in yoghurt manufacture and they do not produce gases or obnoxious smells and other harmfull effects. It is therefore a food that is suitable for all ages. Tchnology of yoghurt could the obtained from IDB or Yoghurt Technology Centre at No: 11, 1st Lane, Ratmalana. This product could be manufactured on small or very large scale with comparatively low investment. However it is extremely necessary to adhere to strict hygienic and sanitary practices and adherence to the codex alimentarious Commission laid down conditions, with HACCP.

The famous philosophical statement of Hipocrates, the father of medicine that " food is thy medicine and medicine thy Food" is true through out the history of man kind and is scientifically revealed today, than at any other time and will be nourished by the present and future research on plant and animal biochemicals (Neutraceuticals and phyto ceuticals).

Some of the recorded health benefits of yoghurt due of the presence of probiotic, Lactobacileus bulgaricus and streptococcus thermophillus are as follows. These probiotic

microflora remain alive in the gastro intestinal rtract when taken as yoghurt or with other solid food.

- It is necessary to use fresh Youhurt for better health
- Immune health reduction of gastrointestinal disorders such as diarrhoea, gastritis, peptic ulcers etc.
- Prevention of infant diarrhoea a major cause of infant mortality in many countries,
- Lactic acid formed in yoghurt manufacture is able to destroy cholera bacteria and hence simillar products are used to prevent cholera epidemics.
- Detoxify the gastrointestinal tract and assist in digesting nutrients.
- Lactose intolerants could consume yoghurt to obtain nutrients.
- Recently introduced inulin a prebiotic fiber like carbohydrate increase the activity of live active cultures. It is a source of dietary fiber and help the body to absorb calcium. Yoghurt is a good source of calcium

There is a tendency to add several probioticis to imporove the health of segments of the market e.g. L.bulgaricus, Streptococous thermophillus, lactobacillus acidopllus, Bifidobacterium, Lactobacillus Casei and lactobacillus reuteri.

Doctors today are far more knowledgeable about the role of nutrition on disease prevention and treatment, and as such physicians represent a growing factor in the developing market for probiotics

- As antibiotics destroy the good bacteria of the intestine pro biotics is a way to offset this effect.
- Probiotics are seen as a means of fighting antibiotic resistant strains of bacteria such as staphylococcus instead of using drugs.
- Probiotics could consume or crowd out the bad.
- Probiotics have certain anti-againg effects related to better uptake of nutrients and micro-nutrients.
- Japanese drink a probiotic drink called Yakult, which is consumed by 24 million people daily
- To improve nutritional values production of probiotic based Soy Yoghurt, new bacterial strains, dietary fiber, natural vitamins and folic acid for women, more natural sweetners are used.
- Trend is for yoghurt products free of genetically modified organisms.

However in future new disease fighting strains are envisaged, which invariably will require a new debate over the role of genetically modified organisms.

Yoghurt had become the darling of dieters, and the lunch of choice for young women in America.

- Yoghurt, kefir and simillar fermented products are on the way of becoming major nutraceuticals aimed at treating a variety of disease conditions. Lactic acid bacteria disable pathogens.
- Prebiotic products used in yoghurt and similar products include, Lactobacillus delbrueekii subsp bulgaricus, used for flavour formation, development of lactic acid, rapid acidification, Lactobacillus fermentum produces less lactic acid.
- Yoghurt is made by culturing milk with the organisams, addings, thikeners, flavouring with sweeteners, fruit preparations. Thickeners may be modified Starehes, Agar-Agar, pectin or other Hydrocolloids selected to provide a specific texture. Yoghurt with soya milk to add phytoceuticals and may contain a source of omega - 3 fatty acids or other special fats. Yoghurt may be spoonable or drinkable.

They cross the line between dietary supplements, medical foods and conventional foods with great facility. Frozen yoghurt with Probiotics resemble ice creams.

- Streptococcus thermoplillus is frequently cultured with Lactobacillus bulgaricus to prevent the development of Lactic acid after the yoghurt is made and to improve long term flavour during refrigerated shelf life of the yoghurt products. Streptococcus themophillius produce antibacterial Bacteriocins usually with a fairly narrow activity spectrum.

- Research work also has discussed the role of lactic acid producing bacteria in preventing carcinogen induced preneoplastic lesions and tumours in rat colon.

Lactobacillus bulgaricus and streptococcus thermophillius are claimed to produce some health benefits, but they do not survive under the acidic conditions of and Bile concentration usually excountered in the gastro intestinal tract. Therefore for Yoghurt to be considered as a probiotic food L. acidophillus and a Bifido bacteria is added.

Bifidobacteria produces acetic acid and take a long time to curdle. There are 56 species of laclobacilli and 29 species of bifido bacteria. Unlike yoghurt bacteria, probiotics bacteria grow very slowly.

Probiotics could survive in acidic media and in the stomach with a P^H as 1.5. low as 1.5 to 2.0.

Yoghurt Bacteria has a symbiotic relationship with L. Bulgaricus producing essential amino acid, owing to the proteolytic nature for the benefit of streptococcus thermophillus. Streptococus thermophillus consume oxygen and create a low oxygen environment for optimal growth of L. Bulgaricus . Thus the combination grow rapidly and set the yoghurt. Therefore the usual practice is to add probiotic bacteria to Yoghurt Bacteria to reduce the fermentation time.

Probiotic bacteria may take about 24 hrs. while with Ypghurt calture setting time is less than 4 hours. Hence probiotic bacteria are used as an adjunct starter.

Reduction in serum cholesterol when formented milk containing 10 g of probiotic bacteria was given to hypercholesterolemic human subjects has lowered cholesterol levels from 3.0g/L to 1.5 g/L. Role of Bioficbacteria in reduchtion of cholesterol is not completely understood.

Bifidus Yoghurt is manufactured using traditional S. Thermophillus, L. Bulgaricus and Bifidobacteria, Bifidobacteria is aneorobic and S thermoplillus fast consume oxygen and create a conducive environment for rapid setting.

Flow Chart of Yoghurt Manufacture