Frequently Asked Questions:

1. **Define dairy. What are dairy products?**

A dairy can be defined as a business enterprise which has been established for the harvesting of milk or for the processing of animal milk. The milk is majorly obtained from cows or goats, but also from buffaloes, sheep, horses or camels. The obtained milk is supplied to humans for consumption.

A dairy product is a food product produced from the milk of mammals. Dairy products are energy rich food products. A production plant where the processing of milk takes place is called a dairy or dairy factory. For consumption by humans, dairy products are sourced primarily from the milk of cows, buffaloes, goats, sheep, yaks, horses and camels. Dairy products are found in abundance in the European, Middle Eastern and Indian cuisine. Whereas, they are not very well known in traditional East Asian cuisine.

2. **What is the status of milk and milk products in the developing and developed countries?**

In the developed countries, the per capita consumption of milk and milk products is higher. Currently, the gap between the developed and developing countries is narrowing. The demand for milk and milk products in developing countries is growing with rising incomes, growth in population, urbanization and a growing trend towards a healthy diet. The trend is more pronounced in East and Southeast Asia, particularly in extremely populated countries such as China, Indonesia and Vietnam.

The growing demand for milk and milk products offers a great opportunity for producers in high-potential, peri-urban areas to enhance their livelihoods through increased production to meet the market needs.By volume, liquid milk is the most consumed dairy product throughout the developing world. Traditionally, there is demand for liquid milk in urban centers and fermented milk in rural sectors. But processed milk products are becoming increasingly important in many countries.

3. **Give a summary of the worldwide market consumption of milk and milk products.**

Data has it that more than 6 billion people worldwide consume milk and milk products. A vast majority of these people live in the developing nations.Over the last two decades, there has been an decrease in the per capita milk consumption in sub-Saharan Africa. Since the early 1960s, the per capita consumption of milk in the developing nations has almost

doubled. But compared to the other livestock products such as meat and egg which has shown a fivefold increase, the consumption of milk is growing at a slower pace.

The per capita consumption of milk is high in Argentina, Armenia, Australia, Costa Rica, Europe, Israel, Kyrgyzstan, North America and Pakistan. The consumption is medium in India, Islamic Republic of Iran, Japan, Kenya, Mexico, Mongolia, New Zealand, North and Southern Africa, most of the Near Iran and most of Latin America and the Caribbean. The consumption is low in Vietnam, Senegal, most of Central Africa and most of East and Southeast Asia.

In India, about 50 percent of milk is consumed on-farm. Milk provides 3 percent of dietary energy supply in Asia and Africa, compared with 8 to 9 percent in Europe and Oceania. It provides 6 to 7 percent of dietary protein supply in Asia and Africa, compared with 19 percent in Europe and 6 to 8 percent of dietary fat supply in Asia and Africa, compared with 11 to 14 percent in Europe, Oceania and the Americas.

4. What is Codus Alimentarius' definition of a milk product? What is the per capita consumption of milk in the developing countries?

Codex Alimentarius defines a milk product as a "product obtained by any processing of milk, which may contain food additives, and other ingredients functionally necessary for the processing". The range of milk products varies significantly from region to region and among countries in the same region, depending on dietary habits, the milk processing technologies available, market demand, and social and cultural circumstances.

The per capita consumption of milk and milk products is higher in developed countries, but the gap with many developing countries is narrowing. Demand for milk and milk products in developing countries is growing with rising incomes, population growth, urbanization and changes in diets. This trend is pronounced in East and Southeast Asia, particularly in highly populated countries such as China, Indonesia and Viet Nam. The growing demand for milk and milk products offers a good opportunity for producers in high-potential, peri-urban areas to enhance their livelihoods through increased production.

5. Differentiate between Cheese and Cottage cheese.

Cheese is a fermented milk product. The content of milk fat in cheese ranges between 1 – 75%. The fermentation of cheese is brought about by a variety of bacteria or mold. Cheese is produced by the coagulation of the milk protein casein. It consists of proteins and fat from milk. During production of cheese, the milk is usually acidified and the enzyme rennet is added to induce coagulation. The solid content is then pressed into the final form. Cheese is valued for its portability, long shelf life and high content of fat, protein, calcium and phosphorus. There are many types of cheese, with around 500 verities recognized by the International Dairy Federation. The variety may be grouped or classified into types according

to criteria such as length of ageing, texture, methods of making, fat content, animal milk, country or region or origin etc. with these criteria being used singly or in combination.

Cottage Cheese is a cheese curd product having a mild flavor. It is drained and not pressed. It is because of this reason that whey remains and the individual curds remain loosely found in cottage cheese. It is not aged or colored. Different styles of cottage cheese are made from milks with different fat levels and in small-curd or large-curd preparations. Cottage cheese which is pressed becomes hoop cheese, farmer cheese, pot cheese, or queso blanco. Cottage cheese can be eaten in a variety of different ways: by itself, with fruit and sugar, with salt and pepper, with fruit puree, on toast, with tomatoes, with granola and cinnamon, as a chip dip, as a replacement for mayonnaise in tuna or chicken salad, insalads, or used as an ingredient in recipes such as jello salad and various desserts. Cottage cheese with fruit such as pears, peaches, or mandarin oranges is a standard side dish in many "home cooking" or meat-and-three restaurants' menus in the United States.

6. What is crème and cultured sour crème?

Crème is the fatty layer of milk. The typical milk fat content is 30 – 40%. The fermentation agent is naturally occurring lactic acid bacteria. The shelf life is about 10 days.

In sour cream, the fermentation is brought about by *Lactobacillus lactis* subsp. *lactis*. It is mesophilic fermented milk, originally from Scandinavia.

7. How is curds and butter made?

Curds is obtained by the coagulation of milk by a process called curdling. The coagulation is usually induced by the addition of the enzyme rennet or any other edible acidic substance like vinegar or lemon juice and then allowing it to sit. The increase in acidity (pH) causes the milk protein casein to tangle into solid mass or curds. Milk which is left naturally to sour also produces curds. Sour milk cheeses are produced this way.

Butter is made by churning fresh or fermented cream or milk which seperates the butterfat from the buttermilk. Butter is a water-in-oil emulsion resulting from an inversion of the cream. The milk proteins such as casein are the emulsifiers. Butter remains solid when refrigerated but softens to a spreadable consistency at room temperature. It has a pale yellow color. But the color varies from deep yellow to nearly white. Dairy products are pasteurized during production to kill harmful microbes. Butter which is made out of pasteurized fresh

cream is called sweet cream butter. Butter made from fresh cream or cultured unpasteurized cream is called raw cream butter.

8. What is yoghurt? How is it produced?

Yogurt is produced by the bacterial fermentation of milk. The bacteria used to make yogurt are known as "Yogurt cultures". Yogurt can be more aptly defined as thermophilic fermented milk brought about by the action of *Lactobacillus bulgaris* and *Streptococcus thermophilus*. Fermentation of lactose by these bacteria produces lactic acid, which acts on milk protein to give yogurt it's texture and it's characteristic tangy taste. All over the world, the milk protein casein is used to make yogurt. The typical shelf life is about 35 – 40 days. The yogurt which we obtain from dairy is produced using a culture of *Lactobacillus delbrueckii* subsp.*bulgaris* and *Streptococcus thermophilus* bacteria. Sometimes, other species of *lactobacillus* and *bifidobacteia* are used during or after culturing yogurt.

9. Define ghee and whey butter.

Ghee is clarified butter that has been heated to around 120^0c after the water evaporates vital in producing the antioxidants that help it protect from becoming rancid. It is because of this that ghee can be kept for 6 to 8 months under normal conditions at room temperature.

Whey butter is formed when the cream is separated from whey instead of milk, whey butter is obtained. It is a byproduct of cheese making. Whey butter can also be made from whey cream. Whey cream and butter have a lower fat content. The test is much more salty, tangy and cheesy. They are much cheaper than sweet cream and butter. They have a lower fat content. 1000 pounds of whey yields about 3 pounds of butter.

10. What is buttermilk? What are the different types of buttermilk?

Originally, buttermilk was the liquid left behind after churning butter out ofcream. This type of buttermilk is known as *traditional buttermilk.* The term *buttermilk* also refers to a range of fermented milk drinks, common in warm climates (e.g., the Balkans, the Middle East, Turkey, Afghanistan, Pakistan, Nepal, India, Sri Lanka, Nicaragua and the Southern United States) where unrefrigerated fresh milk sours quickly, as well as in colder climates, such as Scandinavia, Ireland, Netherlands, Germany, Poland, Slovakia, Slovenia, Croatia and the Czech Republic. Another variant is a fermented dairy product known as ***cultured buttermilk*** is produced from cow's milk and has a characteristically sour taste caused by lactic acid bacteria. This variant is made using one of two species of bacteria—either *Lactococcus lactis* or *Lactobacillus bulgaricus*, which creates more tartness. The

tartness of buttermilk is due to acid in the milk. The increased acidity is primarily due to lactic acid produced by lactic acid bacteria while fermenting lactose, the primary sugar in milk. As the bacteria produce lactic acid, the pH of the milk decreases and casein, the primary milk protein, precipitates, causing the curdling or clabbering of milk. This process makes buttermilk thicker than plain milk. While both traditional and cultured buttermilk contain lactic acid, traditional buttermilk tends to be less viscous, whereas cultured buttermilk is more viscous. Buttermilk can be drunk straight, and it can also be used in cooking. Soda bread is a bread in which the acid in buttermilk reacts with the rising agent, sodium bicarbonate, to produce carbon dioxide which acts as the leavening agent.

11. What is casein? Explain its making and uses.

It is milk protein belonging to the family of phosphoproteins. Casein is commonly found in mammalian milk. Casein makes up 80% of proteins of cow milk and about 20 – 45% of the proteins of human milk. Casein has a wide variety of uses, from being a major component of cheese, to use as a food additive, to a binder for safety matches. As a food source, casein supplies amino acids, carbohydrates, and the two inorganic elements calcium and phosphorus. Cheese consists of proteins and fat from milk, usually the milk of cows, buffalo, goats, or sheep. It is produced bycoagulation of casein. Typically, the milk is acidified and then coagulated by the addition of rennet, containing a proteolyticenzyme, typically obtained from the stomachs of calves. The solids are separated and pressed into final form.

Unlike many proteins, casein is not coagulated by heat. During the process of clotting, milk-clotting proteases act on the soluble portion of the caseins, κ-casein, thus originating an unstable micellar state that results in clot formation.

12. What is paracasein, chymosin and kumis?

When coagulated with chymosin, casein is sometimes called paracasein. Chymosin is an aspartic protease that specifically hydrolyzes the peptide bond in casein, and is considered to be the most efficient protease for the cheese-making industry. British terminology, on the other hand, uses the term caseinogen for the uncoagulated protein and casein for the coagulated protein. As it exists in milk, it is a salt of calcium.

Kumis is a carbonated fermented milk beverage traditionally made from horse milk. It has a shelf life of 10 – 14 days. The fermentation agents are *Lactobacilli* and Yeast.

13. What is filled milk?

Filled milk is milk from any source or the cream of it that has been reconstituted with vegetable fats. Pure evaporated filled milk is generally considered unsuitable for drinking because of its particular flavor, but is equivalent to unadulterated evaporated milk for baking and cooking purposes. Other filled milk products with substituted fat are used to make ice cream, sour cream, whipping cream, and half-and-half substitutes among other dairy products. Coconut oil filled milk became a popular cost-saving product sold throughout the United States in the early 20th century. Coconut oil could be cheaply imported, primarily from the Philippines, and this product was able to undercut the market for evaporated and condensed milk. At the time, liquid milk was not widely available or very popular because of the rarity of refrigeration and the problems of transportation and storage.

14. What is powdered milk, acidophilus milk and paneer?

Milk is brought into a powdered form by spraying it on heated metal plates. Usually milk is powdered to preserve it and to extend its shelf life. Powdered milk does not need to be refrigerated as it has a low moisture content.

Acidophilus milk is thermophilic fermented milk, often low fat. The fermentation is brought about by *Lactobacillus acidophilus*. The fat content is as low as 0.5 – 2% ; shelf life is 2 weeks.

Paneer is fresh cheese. Paneer is unaged, acid regulated, non-melting product made by curdling heated milk with the addition of vinegar, lemon juice or any other such food acids.

15. What is Viili, Aarts, Basundi and Gelato?

Viili is also known as filbunke. It is mesophilic fermented milk that may or may not contain fungus on the surface. It is originally from Sweden, a Finnish speciality. It has a considerably low fat content ranging between 0.1 – 3.5%. The fermentation is brought about by *Lactococcus lactis* subsp.*cremoris, Lactococcus lactis* biovar.*diacetylactis*, *Leuconostoc mesenteroides* subsp.*cremoris* and *Geotrichum candidum*. It has a shelf life of about 14 days.

Aarts is dried fermented milk mixed with varying measures of sugar, salt and oil. It is eaten as a snack or reconstituted as a warm beverage in Mongolia.

Basundi is an Indian dessert consumed in Bihar, Maharashtra, Gujarat and Karnataka. It is a sweetened dense milk made by the boiling of milk on low heat until milk thickens and is reduced to half.

Gelato is derived from the Italian word for ice-cream. It is made from milk and sugars. Sometimes fruity flavours and nuts may be added for taste enhancement. The sugar content in homemade gelato, as in other styles of ice cream, is balanced with the water content to act as an anti-freeze to prevent it from freezing solid. Types of sugar used include sucrose, dextrose, and inverted sugar to control apparent sweetness. Typically, gelato—like any other ice cream—needs a stabilizing base. Egg yolks are used in yellow custard-based gelato flavors, including zabaione and creme caramel, and non-fat milk solids are also added to gelato to stabilize the base. Starches and gums, especially corn starch, are sometimes also used to thicken and stabilize the mix.