FAQs answer type questions

Q1. What are fermented dairy products?

Ans. Fermented dairy products are products that can be produced via fermentation of lactose by microorganisms naturally found in milk or added as starters. These are made from milk of almost all domesticated milch animals.

Q2. Describe in brief the advantages of fermented foods.

Ans. There are number of advantages of taking fermented foods which may include the following:

- > They offer a high degree of hygienic safety.
- > They have an increased shelf life compared to the raw product.
- ▶ Raw materials are refined by improving quality-determining properties.
- ➤ Manufacture requires only basic technology and low energy consumption.
- > They meet a demand for natural and organic food.

Q3. What are dairy starter cultures?

Ans. Dairy starter cultures are selected microorganisms, which are deliberately added to milk to initiate and carry out desired fermentation under controlled conditions in the production of fermented milk products. Most of them belong to lactic acid bacteria (*Lactococcus, Lactobacillus, Streptococcus* and *Leuconostocs*), however, few non-lactic starters (bacteria, yeast and mold) are also used along with lactic acid bacteria during manufacturing of specific fermented milk products, such as kefir, kumiss and mold ripened cheeses.

Q4. What are the various functions of a starter culture?

Ans. The major functions of starter culture during fermentation:

- a) Production of primarily lactic acid and few other organic acids, such as formic acid and acetic acid.
- **b)** Coagulation of milk and changes in body and texture in final products.
- c) Production of flavoring compounds, e.g., diacetyl, acetoin and acetaldehyde.
- d) Help in ripening of cheeses by their enzymatic activities.
- e) Produce antibacterial substances in the finished product.

Q5. What is the role of propionibacteria in swiss cheese?

Ans. Propionibacteria ferment lactic acid, carbohydrates and polyhydroxy alcohols to propionic acid, acetic acid and carbon dioxide (CO). Conversion of lactic acid to propionic acid gives characteristic sweet flavour in Swiss chees²e, while CO helps in eye formation, a typical regular holes in cheese body, which is essential in Swiss chee²se.

Q6. What are the different mechanisms for uptake of lactic acid in lactic acid bacteria?

Ans. Lactic acid bacteria have two different mechanisms to take up lactose from the medium and its subsequent hydrolysis:

a) Most of the Lactobacilli, Leuconostocs and *S. thermophilus* take up lactose through a specific permease enzyme located in cell membrane. The lactose inside the cell is then splitted by enzyme β -galactosidase into glucose and galactose. The galactose is converted to glucose and together with glucose is fermented by glycolysis.

b) Lactococci and a few lactobacilli like *Lb. casei*, take up lactose and galactose by the action of phosphoenol pyruvate dependant phosphotransferase system, which involves catalytic activity of four specific proteins. The lactose is phosphorylated while in transportation and is hydrolysed by β -phosphogalactosidase into glucose and galactose-6-phosphate. The galactose is utilized to lactic acid by tagalose-6-P pathway. *S. thermophilus*, *Lb. delbrueckii* subsp. *bulgaricus* and occasionally *Lc. lactis* do not metabolize galactose.

Q7. What are the changes that occur in milk proteins during .

Ans. Proteolysis in milk takes place by exo- or endo-peptides of lactic acid bacteria. The biological value of protein increases significantly from 85.4 to 90 per cent. This increase is due to breakdown of protein into peptones, peptides and amino acids. The contents of essential amino acids such as leucine, isoleucine, methionine, phenylalanine, tyrosine, threonine, tryptophan and valine increase considerably. During fermentation and storage the amount of free amino acids increases, particularly lysine, proline, cystine, isoleucine, phenylalanine, and arginine. Due to these biochemical changes in milk protein during fermentation make these products dietetic in nature.

Q8. Describe in brief the health benefits of fermented dairy foods?

Ans. Fermented milk products are known for their nutritional, therapeutic and prophylactic values. There are numerous advantages of regular intake of fermented milk products, such as yoghurt, dahi, acidophilus milk, kefir, etc. These products are easily absorbed and better assimilated thanwhole milk. Better assimilation of fermented milk product is due to partial peptonization and intensity of secretion of ferment by digestive tract glands. They stimulate appetite due to their pleasant, refreshing and pungent taste. These products also improve central

nervous and respiratory system. They help in controlling gastrointestinal disorders, such as diarrhoea, constipation, dyspepsia, flatulence and colitis. They also have antiproliferative activity.

Q9. Name the microflora involved in the making of cultured buttermilk.

Ans. Starter cultures used for the development of cultured buttermilk are typically mixtures of flavour and acid producers *Leuconostoc spp.* and *Lactococcuslactis* subsp. *diacetylactis* produces diacetyl, the flavor most commonly associated with flavored butter and *Lactococcus lactis* is used to produce lactic acid which contributes to the acidic flavor typically associated with cultured butter milk.

Q10. What are kefir grains?

Ans.Kefir grains are a combination of lactic acid bacteria and yeasts in a matrix of proteins, lipids, and sugars, and this symbiotic matrix forms "grains" that resemble cauliflower. Kefir grains contain a water-soluble polysaccharide known as kefiran, which imparts a rope-like texture and feeling in the mouth. The grains range in color from white to yellow, and may grow to the size of walnuts.

Q11. Discuss the composition of kefir.

Ans.The composition of kefir depends greatly on the type of milk that was fermented, including the concentration of vitamin B_{12} . During fermentation, changes in composition of nutrients and other ingredients occur. Lactose is broken down mostly to lactic acid (25%) by the lactic acid bacteria, which results in acidification of the product. Propionibacteria further break down some of the lactic acid into propionic acid. Other substances that contribute to the flavor of kefir are pyruvic acid, acetic acid, diacetyl and acetoin, citric acid, acetaldehyde and amino acids resulting from protein breakdown. The slow-acting yeasts break lactose down into ethanol (1–2%) and carbon dioxide. Most modern processes, which use shorter fermentation times, result in much lower ethanol concentrations (0.2–0.3%).

Q12. Give the flow chart for the production of artisanal kumis.

Ans. Theflow chart for the production of traditional kumis is given below:



Q13. Write in brief the characteristics of some important cheese varieties.

Ans. There are thousands of cheese varieties available in the market. However, the below mentioned cheese varieties are famous in all parts of world. Characteristics of each of the variety are given below:

Cheddar: Cheddar is a hard variety with about 40% moisture and its taste depends upon the age of the cheese. Mild Cheddar is perfect for sandwiches because it has a mellow balance of flavors. Sharp Cheddar is good for cooking because its flavor is released when heated and it shreds well with other cheeses.

Mozzarella: Mozzarella has a mild, milky taste and is more of a cooking cheese due to its good binding properties, moist texture and ability to melt. It absorbs the flavors and juices of the ingredients surrounding it and is perfectly designed for cooking. Mozzarella is an ideal cheese for Pizza making.

Swiss: Swiss cheese, which is also known as Emmental or Schweizer, is a firm cheese with a sweet, mildly nutty flavor. This cheese is known for the holes or eye formation that develops as it ripens.

Camembert: Camembert has a soft texture with a buttery taste and mushroom smell. It tastes best when it is at room temperature and the center becomes soft and it is a mold-ripened cheese.

Q14. What are the different ways of concentrating milk for cheese production?

Ans. Cheese manufacture is essentially a dehydration process in which the casein, fat and colloidal salts of milk is concentrated. Concentration is achieved by coagulating the casein byenzyme modification (rennet cheeses), acidification to isoelectric point (pH 4.6) by starter or addition of acid, oracidification to pH 5.2 - 5.4 by starter or addition of acid and heating to 70–80°C. Ultra-filtration is also being used commercially for concentration of the total colloidal phase of milk.

Q15. How is dahi different from yogurt?

Ans. Dahi or curd is an Indian fermented milk product which is equally known for its palatability, refreshing taste and therapeutic importance. Some of its characteristics are similar to other fermented milk products such as yoghurt and acidophilus milk but it differs with regard to heat treatment of milk, starter culture, chemical composition and taste.