FAQs

1. **What is buffering capacity? Name the components in milk those are responsible for buffering capacity?**

   Resistance of any liquid to changes in pH on addition of acid or alkali is called buffering capacity of the solution. Milk contains a range of groups which are effective in buffering over a wide pH range. The principal buffering compounds in milk are its salts particularly soluble calcium phosphate, citrate and bicarbonate, and acidic and basic amino acid side-chains on proteins particularly of caseins.

2. **Whey the colour of buffalo milk is white and that of cow milk is yellow?**

   The white colour of milk is due to the scattering of visible light rays by casein miscelles and fat globules. The yellow colour of cow's milk is due to presence of yellow colored pigments i.e, carotenes while the buffalo milk looks whiter due to absence of this component.

3. **Whey milk tastes both sweeter and salty?**

   Flavour is defined as the combination of taste and smell. The taster of the milk is both sweet and salty. The sweet taste is contributed mainly from the lactose content while the salt taste is due to the salts present in the milk. The milk fat contributes to the rich mouthfeel and flavour. Higher the milk fat, richer will be the flavour.

4. **What are the factors those affect the viscosity of milk?**

   Viscosity is defined as the resistance to flow. Important factors that influence the viscosity of milk are:

   Changes in the caseinate micelles produced by either raising or lowering the pH results in increased viscosity.Viscosity increases with increasing concentration of fat and solids-not –fat. Homogenization increases the viscosity of the milk due to increase in number of fat globules in the milk

   The viscosity of milk and dairy products depends up on the temperature and on the amount and state of dispersion of the solid components.

Cooling increases viscosity due to the increased volume of casein micelle and temperatures above 65^0C increase viscosity due to the denaturation of whey proteins. Agitation may cause partial coalescence of the fat globules (partial churning) which increases viscosity. The colostrum and late lactation milk exhibits higher viscosity when compared to normal milk of the same animal.

5. **What is maillard reaction?**
   Maillard reaction is a non-enzymatic reaction which takes place between lactose and proteins of milk at high temperature. The most important heat induced changes in dairy products that involve lactose are the changes associated with browning. Milk is the only important naturally occurring protein food with a high content of reducing sugar. Lactose reacts with protein in milk. The reaction of lactose with the caseins and whey proteins of milk systems is being the Maillard or non-enzymatic browning reaction.

6. **What is redox- potential? What is its importance in ascertaining the microbial quality of milk?**
   Redox potential is nothing but reduction-oxidation potential. Oxidation is loss of electrons while reduction is the gain of electrons. In a redox system when half of the system is having oxidation reaction and the other half is having a reduction reaction there will be no flow of electrons either in to the system or go out of the system. The concentration of dissolved oxygen is the principal factor affecting the redox potential of milk. Milk is essentially free from oxygen when secreted but in equilibrium with air, its oxygen consent is about 0.3mM. This potential is of great importance in determining the microbial, quality of milk.

7. **What is freezing point of milk? How milk constituents contribute to the freezing point?**
8. **The temperature at which the milk is solidified in called freezing point of milk.** The average value for cow milk is close to -0.522^0C, buffalo milk -0.560^0C. Freezing point depression of milk is inversely proportional to the souring of milk, fortification of milk with lactose or non fat solids or addition of sugar will increase the depression of

thefreezing point. Amount of water added decreases the freezing point depression.The major components affecting the freezing point are lactose and soluble salts. 75 to 80% of the depression of the freezing point is due to these two constituents. Fat, protein, colloidal calcium phosphate, casein colloids and fat globules have negligible effect on the freezing point of milk.

9. **What is refractive Index? How this property is used in fat estimation in milk?**

   When a beam of light passes from one medium to another, the light rays bends. The basic principle in determining the refractive index is the fact that the degree of bending of light wave passing through a liquid or transparent solid is a characteristic for the particular liquid or solid. The bending or refraction of the light is expressed as its refractive index. Milk absorbs light of wavelengths between 200 and 380 nm due to presence of proteins and between 400 and 520 due to presence of fat globules particles. Scattering of light by the globular fat particles present in milk has been used to estimate its fat content. The commercial milko-scanners to estimate fat, proteins, lactose and minerals have been developed by using this principle.

10. **What is caramelization? How it differs from maillard reaction**

    Caramelization is the oxidation of sugar by heating resulting in the production of nutty flavour and changing to brown colour during baking. During the process, volatile chemicals are released, producing the characteristic caramel flavour.Caramelization takes place when the sugar is heated to above 170^0C. It is a non-enzymatic browning taking place in absence of proteins while maillard reaction takes place in presence of proteins.