

The natural properties of milk

Liquid milk is a white emulsion The color is not transparent has a sweet taste Light The natural properties of milk depend on the materials included in its composition. Some of these characteristics enable us to detect the quality of milk upon receipt factory like:

- 1- Color, taste, smell, acidity, and hydrogen ion concentration
- 2- Estimating the osmotic pressure helps to know whether the milk is good or not

In terms of animal health.

- 3- Knowledge of the viscosity and acidity of milk helps in designing manufacturing machines Convenience.
- 4- Estimating the specific weight of milk, density, freezing point and viscosity in addition to the refractive index helps in detection The methods used to know adulteration of milk with water.
- 5- Estimating the specific heat of milk helps in calculating the heat energy Necessary for the manufacture of milk and its products, such as pasteurization and sterilization condensation and drying. Also, the expansion of the milk helps in calculating the capacity The tanks in which the milk will be kept after heat treatment.

the color: The color of natural milk ranges from white to a relatively bluish color to a golden yellow color sometimes, depending on: the percentage of fat-- The proportion of non-fat solids---animal breed---food may be the milk is opaque when it is in the form of thick layers As for milk without The fat, or the one that contains a small percentage of it, then its color tends to be bluish, or the one that contains a small percentage of it, its color tends to bluish. The color Milky white is the result of light reflection by suspended matter Milk (fat - proteins - colloidal phosphorus salts) The yellow color is due to the presence of carotene pigment (green fodder). And to the presence of riboflavin dye dissolved in the milk serum.

Taste: Milk has a slightly sweet taste, so milk is characterized by a mild sweet taste. Whenever The fresher the milk, the closer it tastes to sweetness, and this is due to the presence of a percentage High in milk sugar and low in chloride content. This disappears the taste once left for a few hours as the lactose turns into lactic acid with the effect of bacteria, the taste of milk becomes acidic. Also, the taste of milk It changes according to the types of bacteria present in it and the incidence of diseases and methods Preservation. Milk compounds are affected by many factors, such as enzymes and heat and the light cause natural and chemical changes to change the taste of the milk

Odor or flavor: Milk has a special smell, and the milk loses its smell after hours Milking process or after cooling or degassing. The pleasant flavor of milk is also closely related to the percentage of the sugar lactose and chloride, Lactose directly affects the flavor while the effect of chloride inversely, milk that contains a low percentage of lactose and a high percentage in chloride, may have a salty taste (end of milking stage + udder injury). Unusual odors may occur in the milk as they change according to Types of bacteria and methods of preservation

Factors affecting the flavor of milk:

1. The type of food provided to the animal, such as cabbage, onions, garlic, and silage
2. The condition of the animal (in cases of abnormal udders)
3. Absorbing the odors surrounding the milk
4. Contamination of milk with foreign substances such as animal feces when milking.
5. Prolonging the milking period for the animal
6. Decomposition of some components of milk by microbes or the occurrence of changes Chemical where some metals such as iron and copper lead Metallic or it accelerates other flavor changes to create a special flavor is a metallic flavor

(the chemical reactions that may occur in milk, they contribute to the production of milk Some smells and tastes such as):

1. The rancid flavor as a result of the hydrolysis of the fat by the lipase enzyme
2. Oxidized flavor (fish smell) as a result of lecithin oxidation.
3. Sour flavor, as a result of the increased acidity.
4. Unclean flavor due to the presence of Bacillus coli microbes (Coli form).
5. Fruit flavor due to the presence of yeasts
6. The bitterness flavor is due to animal food or microbes
7. Cooked flavor is due to the continued heating of milk at a temperature higher than 78 c
8. The salty taste is due to the higher percentage of chlorides than sugar in milk The end of the milk period or in the case of mastitis
9. The flavor of amyl alcohol is attributed to the contamination of milk with a microbe (Micrococcus)
10. Carbolic acid flavor, due to microbe contamination of milk with Bacillus bacteria Spore forming

Specific gravity/density: The specific weight of milk is the ratio between the weight of a given volume of milk in degrees The temperature of 13.3 c to the weight of a similar volume of water at the same temperature. Milk contains substances that increase its specific weight, so the weight of milk The specific gravity is greater than the specific gravity of water. Also, the fat reduces the specific gravity The higher the amount of fat in the milk, the lower the weight Specific, which leads to a decrease in the density of milk as for the effect of non-fat solids The opposite is the case. The specific weight of cow milk is 1.032, and since milk Heavier than water, one liter of it weighs more than one liter of water. As for the fat, its specific weight is less than one... the specific weight must change to milk by simply adding water to it or separating the fatty substances from it the specific weight of milk helps to know whether the milk is adulterated or not That is, as evidence that water was added to it or fatty substances were isolated from it. And from this It appears that the specific weight of milk is the result of the specific weights of its components different.

Adhesion: Milk has the ability to stick, due to the presence of casein

It was possible to produce glue from it that is used in industrial purposes and the plastics industry.

Surface tension: Milk is less surface tension than water due to the presence of reducing substances It is like lipoproteins that are concentrated around lipid granules

degree/boiling point: It is the temperature at which milk is in equilibrium between the liquid state and gassy. Because milk contains many of the solid compounds dissolved in the milk liquid, its boiling point is higher than Water. The boiling point of water is 100 c under atmospheric pressure The boiling point of milk is 100.17 °C. The boiling point is important Milk is important in the manufacture of condensed and evaporated milk.

Milk freezing point: It is the temperature at which milk is in equilibrium between states Liquid and solid. It is known that water freezes at zero degrees Celsius Whereas milk freezes at a temperature slightly lower than the freezing point of water and is - 0.55 c. The substances dissolved in milk are lactose and some minerals and salts It reduces the freezing point of milk, so it is less than the freezing point of water.

osmotic pressure the osmotic pressure of milk is close to the osmotic pressure of blood The pressure in the milk to the substances dissolved in it as sugar and salts. The relationship between the amount of salt and the amount of lactose in milk have an inverse relationship. That is if we know that the osmotic pressure of milk is constant, so when the milk contents increase from salts The amount of sugar decreases and vice versa.

Milk reaction: The reaction of fresh milk is acidic, and this acidity varies between: The milk of the members of the herd, as well as for fresh milk, ranges between 6.4-6.7 The acidity of the milk is estimated as lactic acid after washing it with a pH solution. Diluted base using phenolphthalein reagent. The acid

reaction of milk Fresh is not the result of the presence of lactic acid, but rather because of the presence of some the acidic components of the reaction are whey proteins and phosphorous salts and salts of citrate, carbon dioxide and caseinate.

Specific heat: The specific heat of liquids is affected by their density. The specific heat varies with different temperatures, for example, the temperature of milk is 15 c , the temperature The specificity of milk is 0.938, but if the temperature of the milk is zero, then the specific heat of milk is 0.920, and the variance of the specific heat of milk products is 0.920 Different dairy products are the result of the different nature of their chemical composition. The specific heat of milk is also important as it is used to calculate its cost Cooling and heating, especially in the case of condensed and dried milk production.

refractive index: The refractive index of a solution or liquid depends on the type and concentration of particles in it. The index of refraction of light in milk is about 1.35, while it is in water 1.33 Therefore, adding an amount of water to milk leads to a decrease in its value The refractive index of light in it. Thus, the refractive index of light is considered one of the Rapid tests to find out the adulteration of milk with water. A device is used Refractometer to know the refractive index.