A Starter culture can be defined as a culture of microorganisms, usually bacterial or fungal strains that are either pure or mixed, which is used to initiate a fermentation process. It can be obtained either as pure culture from a commercial laboratory or from a portion of previously cultured product. The microorganisms are selected for their ability to produce lactic acid for curd production and a low pH to prevent spoilage, produce metabolites that give desirable flavors, or produce enzymes.  As it is known, various dairy products such as yoghurt, kefir, kımız are produced with microorganisms. The fermentation of the beans, the beer and the wine making are again through microorganisms. In addition to these, cheese and butter, sausage, pickles, olives and so on. – There are direct benefits of microorganisms in the production of food. This is the reason why used in food production they are called "starter culture’’ – However with a simple definition, starter cultures are microorganisms used in the food industry to produce products with standard quality under controlled conditions. The starter culture can be one or more microorganisms. It depends on which microorganism or microorganisms are used as starter – Wine, for example, uses a single microorganism with acidophilus, while products such as yoghurt and kefir have two or more microorganisms.

Function of Starter Culture

Starter Cultures can be used as a single strain, mixed strain and multiple strains depending upon the type of products to be prepared. The ability of starter culture to perform its functions efficiently during manufacture of fermented dairy foods depends primarily on purity and activity of starter cultures.

The major roles of starter culture during fermentation of milk are:

1. 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 flavouring compounds, e.g., diacetyl, acetoin and acetaldehyde.

d) Help in ripening of cheeses by their enzymatic activities.

Thus, an ideal starter culture should be selected for the preparation of various fermented milks with the following characteristics.

1. It should be quick and steady in acid production.

2. It should produce product with fine and clean lactic flavour.

3. It should not produce any pigments, gas, off-flavour and bitterness in the finished products.

4. Should be associative in nature in product development

***Types of Starter Cultures***

There are two major groups of starter cultures which are used in the preparation of fermented milk products classified on the basis of their physiological and growth characteristic and their Biochemical characteristics

(a) Physiological and growth characteristics, such as

(i) Mesophillic starter culture

(ii) Thermohillic starter culture

(b) Biochemical characteristics such as

(i) Homofermentative lactic acid bacteria

(ii) Heterofermentative lactic acid bacteria.

*Classification on the basis of physiological and growth characteristics.*

**Mesophillic starter culture**

These cultures have optimum temperature for growth between 20 to 30°C and in *Lactococcus*and *Leuconostoc*. These mesophillic lactic cultures are used in the production of many cheese varieties where important characteristics are:

1. Acid producing activity

2. Gas production, and

3. Production of enzymatic activity for cheese ripening, e.g., proteases and peptidases enzymes.

The importance of fermented milk derived from mesophilic fermentation are consistency which is due to the lactic acid coagulation of the milk proteins and aroma and flavour produced by citric acid and lactose fermentation.

**Thermophilic starter culture**

These cultures have optimum temperature for growth between 37 to 45°C. Thermophilic cultures are generally employed in the production of yoghurt, acidophilus milk, swiss type cheese. Thermophilic cultures include species of *Streptococcus*and *Lactobacillus*. These cultures grow in association with milk and form the typical yoghurt starter culture. This growth is considered symbiotic because the rate of acid development is greater when two bacteria are grown together as compared to single strains.

Thermophilic starter cultures are microaerophillic and fresh heated milk should be used to achieve a better growth of the culture since heat treatment reduce amount of oxygen in the product. The important metabolic activities of thermophilic cultures in development of fermented milk products are:

• Acid production, e.g. lactic acid

• Flavour compounds, e.g., acetaldehyde

• Ropiness and consistency, e.g., polysaccharides

• Proteolytic and lipolytic activities, e.g., peptides, amino acids, fatty acids

• Possesses therapeutic significance, such as

(a) Improvement of intestinal organisms,

(b) Produce antibacterial substances, and

(c) Improve immunity.

*Classification on the basis of biochemical activities*

**Homofermentative lactic starter**

These lactic acid bacteria are characterized for their ability to ferment lactose almost exclusively to lactic acid. The examples of these culturesare: *Lactobacillus acidophilus, Lactobacillus bulgaricus*.

**Heterofermentative lactic starter** These lactic acid bacteria ferment lactose with lactic acid, ethanol/acetic acid and carbon dioxide (CO2) as by-products. Testing for heterofermentative fermentation generally involves the detection of gas (e.g., CO2). With the exception of certain fermented milk products, heterofermentative LAB are rarely used as dairy starter cultures, although they are not uncommon in milk and dairy products. If allowed to grow to significant numbers, they can cause defects related to their acid and CO2 production, such as slits in hard cheeses or bloated packaging in other dairy products. Heterofermentative LAB include Leuconostoc spp. (Gram-positive cocci) and Gram-positive rods such as *Lactobacillus brevis, Lb. fermentum, and Lb. reuteri.* Other Lactobacillus species are considered “facultatively” heterofermentative, meaning they will produce CO2 and other by-products only under certain conditions or from specific substrates. These strains would include *Lb. plantarum, Lb. casei and Lb. curvatus*