

Microbes in Household Products

Microbes in Human welfare

Microbes in Our Daily Life

Ubiquitous Presence

- Microbes are major components of biological systems on earth. They exist everywhere: in soil, water, air, inside our bodies and even in extreme environment like thermal vents.

Household helpers

- Not all microbes are pathogens. Many are used daily in household to produce nutrient rich foods through the natural process of fermentation and protein coagulation.

Curd Production & LAB

Lactic Acid Bacteria (LAB)

- Microorganisms such as *lactobacillus* grow in milk and convert it to curd at suitable temperatures.
- LAB produce acids that coagulate milk protein (casein)
- They partially digest milk protein, making them easier to absorb.
- A small amount of curd serves as an inoculum or starter.



Baker's Yeast and Bread

Saccharomyces cerevisiae

- The dough used for making bread is fermented using baker's yeast. During fermentation, the Yeast breaks down sugars.
- The puffed up appearance of dough is due to the production of carbon dioxide gas. This makes the bread porous and soft.
- Yeast produces Amylase, Maltase and Zymase.



Traditional fermented foods

Idli and dosa

- Rice, Black gram soaked overnight washed mixed and ground.
- The batter is fermented by bacteria, resulting in a puffed appearance due to carbon dioxide production.

Microbes used:

- *Leuconostoc mesenteroides*
- *Streptococcus faecalis*



Traditional fermented foods

Toddy

- A traditional drink of South India made by fermenting the SAP from Coconut water using natural microbes (yeast, lactic acid bacteria, acetic acid bacteria)



The World of Cheese

Different varieties are known for their specific texture flavour and taste determined by the microbes used.

Swiss cheese mechanics

Propionibacterium sharmanii

- This bacterium is used for the production of Swiss cheese. It is a defining example of large scale gas production in food.
- The characteristic large holes in Swiss cheese are due to the production of a huge amount of carbon dioxide.
- The fermentation process alters the texture of the milk solids significantly.



Roquefort: The Blue Fungi

Penicillium roqueforti

- Roquefort cheese is ripen by growing specific fungi on it, which imparts a particular flavour and distinctive blue green veins.
- Unlike Swiss cheese which relies on bacteria, Roquefort relies on fungal ripening to achieve its pungent taste and creamy yet crumbly texture.



Microbe-Product Quick Guide

Household Product	Microbe Involved	Key Benefit / Feature
Curd	<i>Lactobacillus</i> (LAB)	Increases Vit B12; Checks gut pathogens
Bread	<i>Saccharomyces cerevisiae</i>	CO ₂ makes it soft and porous
Toddy	Palm Sap Microbes	Traditional fermented beverage
Swiss Cheese	<i>Propionibacterium sharmanii</i>	Large holes due to CO ₂
Roquefort Cheese	<i>Penicillium roqueforti</i>	Specific fungal flavor and ripening

BT COTTON



PEST RESISTANT PLANTS



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