

# Fermentation and Digestion

Some Teaching Ideas (by Jayashree Ramadas and Karen Haydock)

a. Get two green chillies. Keep one in a little lemon juice and the other without anything. What happens after a few days?

b. Smell and taste some boiled and cooled milk. Put a spoonful of curd in the milk and smell and taste it again. Keep it in a warm place for a few hours and again smell and taste it.

c. Watch how dough for idli, dhokla, batura or bread is made. Smell and taste the dough as soon as it is mixed. Then keep it in a warm place for a few hours. Smell and taste it again.

Did the smell and taste of the \_\_\_\_, the milk and the different doughs change after a few hours?

In what other ways did these foods change?

Do you think the food could be changed back to how it was before?

**Table:**

Name of the food	How long was it kept in a warm place?	Smell		Taste		Could it be changed back to how it was before?	Any other changes
		before	after	before	after		

There are useful microbes in these foods. They eat the food and produce juices that slowly break down the foods into other, simpler forms. This is called fermentation. Something similar happens in the digestion of food inside our body. Our body produces digestive juices just like the juices made by microbes.

**Another Possible Teaching Strategy:**

[An attempt to start with what the students are already more familiar with, and then go on to more abstract things like fermentation]

First discuss what happens when we eat food and then make the analogy with what happens when yeast or bacteria eat - they also break down food and give off waste. Fermentation is the breaking down of substances by certain microorganisms (e.g. the breaking down of sugar into carbon dioxide and alcohol by yeast).

## Fermentation

### Digestion and Elimination of Waste

When we eat food it gets **digested** - broken down into smaller and smaller pieces so that our bodies can use it to live and grow. In this process, our bodies give off the waste products that they do not need.

Other living things also digest food and give off waste products.

**Fermentation** is the digestion (or breaking down) of substances by certain microorganisms. For example, the micro-organisms called yeast break down sugar into carbon dioxide and alcohol.

**How do we use yeast in cooking?**

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### **How is dahi made?**

Did you know that milk already has a kind of sugar in it even if you don't add sugar to it? Can you taste it?

There are tiny microbes in dahi - they are a kind of bacteria. These bacteria eat the sugar in milk.

The bacteria get energy to live and grow by breaking down sugar, changing it into a sour thing called lactic acid.

Can you taste the lactic acid in dahi?

When you mix a spoon of dahi in warm milk, the bacteria find a lot of sugar to eat.

They grow and make new bacteria. The more bacteria there are, the more sugar they eat, and the more lactic acid they give off.

If you wait longer will the warm milk get more sour? Why?

Can you tell how much bacteria there is by tasting?

If the milk is too cold, the bacteria grow much slower.

Suppose you mixed a spoon of dahi in cold milk and kept it in the fridge. What would happen? How would it taste? Try it and see if you are right.

Think of some more questions about dahi that you could answer by doing experiments.