

Indigenous Rice-based Fermented Foods: Idli

Idli is a white, fermented acid (leavened), soft, spongy textured product and steamed cake of rice (*Oryza sativa*) and dehulled black gram dhal (*Phaseolus mungo*) eaten in Southeast Asian countries. Idli is a very popular fermented breakfast food consumed in the Indian subcontinent made mainly of rice and black gram. Soybean, green gram and chick pea can be substituted for the black gram.

Traditionally, idli preparation is as follows:

rice and black gram were soaked separately,
after draining the water, rice and black gram were grind separately with occasional addition of water during grinding process,
the rice and black gram batters were then mixed together with addition of a little salt,
the mixture was allowed to ferment overnight at room temperature,
the fermented batter was dispensed in special idli pans and allowed for steaming for 5–8 min.

The naturally occurring microorganisms are *Leuconostoc mesenteroides* and *Streptococcus thermophilus*, and during fermentation of idli batter overnight in grains/legumes/utensils, they grow rapidly, outnumbering the initial contaminants and dominating the fermentation. These microorganisms produce lactic acid and carbon dioxide that make the batter anaerobic (devoid of oxygen) and leaven the product.

Other fermenting microorganisms (which are lactic acid bacteria) are *Streptococcus faecalis*, *Lactobacillus delbrueckii*, *Lactobacillus fermenti*, *Lactobacillus lactis* and *Pediococcus cerevisiae*. Also, idli batter can be prepared with the blend ratios of 2:1, 3:1 and 4:1 (parboiled rice: black gram).



Several aspects, such as effect of raw materials, effect of fermentation or processing temperature and microorganisms involved in biochemical and nutritive changes, have been investigated along with many methods of idli preparation. It has also been reported that during fermentation, vitamins B and C increase, and also phytate is hydrolyzed almost to 50%.

L. mesenteroides (leavening) and *S. faecalis* (acid production) develop concomitantly at soaking stage and continue to multiply following grinding. The reported changes during fermentation include an increase in free sugar, non-protein nitrogen, free nicotinic acid, methionine and choline in idli, and a breakdown of phytate in bread dough and of trypsin inhibitors in certain fermented legume preparations.

These changes during fermentation are highly significant for nutritional point of view. An

increase in methionine, a limiting essential amino acid in legumes, greatly improves protein value. The vitamins content of idli batter per 100 g are 0.59 mg riboflavin, 0.59 mg thiamine and 0.76 mg folic acid.

Adapted from “Preparation of idli batter, its properties and nutritional improvement during fermentation” by Debasree Ghosh and Parimal Chattopadhyay.

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