

## Indian food researchers make ice cream healthier

If someone said, Ice creams can cater to the requirements of health inclined consumers, would you believe it? You better do. Researchers at CSIR-Central Food Technological Research Institute have developed a developed a low fat synbiotic ice-cream enriched with prebiotic beta-manno-oligosaccharides (beta-MOS) and probiotic; *Lactobacillus* species.

Ice cream follows chocolate as the second most dreaded food. It is fat rich, calorie rich and has no fiber at all. Now prebiotics and probiotics can change all that and turn ice creams into not only a delicious, but also a healthier probiotic food.

Probiotics are live microorganisms which when administered in adequate amounts confer health benefit. Generally, probiotics are said to improve immune system, bowel health, and often credited with anticancer effect. Fermented dairy products like yogurt and curd are popular source of probiotics. Thanks to this research, ice-cream too joins the list of pre and pro biotics.

Prebiotics selectively stimulate the growth of beneficial microbes like *Lactobacillus* species which live in our guts. Most of the dietary fibers serve as excellent prebiotics. A food supplement which combines pre- and probiotic is called synbiotic and can positively affect the consumer's gut by improving the survival of beneficial microbes.

Increasing health consciousness has compelled food scientists to develop food supplements and functional foods that bring proven health benefits apart from delivering the regular nutrients. And each day a new product is being added to the list and the CSIR-CFTRI product is one other addition.

But why chose ice cream to deliver good things? "Ice cream is nutritionally rich food. It is also most widely accepted by people of all section irrespective of their age and socioeconomic status. Hence, it seemed to be an ideal choice for us to develop a healthy ice cream", says Dr. Mukesh Kapoor, the lead scientist.

The team has successfully developed a low-fat synbiotic ice cream using beta-MOS, a plant derived fiber as a prebiotic component and *Lactobacillus plantarum* and *Lactobacillus fermentum* as probiotics.

The ice cream mix consisted of milk powder, sugar, fat, stabilizer, emulsifier, vanillin, milk with or without beta-MOS or Fructo oligosaccharide (FOS). FOS is a well-known prebiotic and hence was used for comparison. Various ice cream formulations were prepared, like normal fat ice cream containing probiotic *Lactobacillus* spp., low-fat ice cream containing probiotic *Lactobacillus* species, low-fat ice cream supplemented with FOS and probiotic *Lactobacillus* species, as well as low-fat ice cream supplemented with beta-MOS and probiotic *Lactobacillus*. All the ice cream mixes were stored at -20°C over a period of time, the temperature at which ice creams are

normally stored. It was found that despite such freezing the ice creams could maintain probiotic cultures from the stored ice creams were later found to survive and populate the extreme conditions of stomach and intestine.

The low fat synbiotic ice creams showed better consistency index, flow behaviour and viscosity, the general characteristics that makes ice-creams likeable, than an ordinary low-fat ice cream. Moreover, these ice creams also had better brightness and were appeared whiter. “The number of probiotic bacteria showed no reduction until 40<sup>th</sup> day. However, their number was reduced marginally on 65<sup>th</sup> day during storage at –20°C” says Dr. Kapoor.

The probiotic bacteria are useful only when they can survive the harsh conditions in the stomach and intestine. To test whether this happened, the novel ice creams were tested in a simulated gastro intestinal environment. The results reveal that, presence of beta-MOS could enhance the survival of *Lactobacillus plantarum* as well as *Lactobacillus fermentum* under gastric and intestinal stress when compared to their respective ice-cream controls.

“Apart from improving the effectiveness of ice cream, the study shows that beta-MOS improves survival of *Lactobacillus* spp. and opens up many opportunities to create new, novel, healthy foods”, says Dr. Mukesh Kapoor.

The research findings were published in a recent issue of journal of Food Processing and Preservation. The team consisted of Dr. Mukesh Kapoor, Principal Scientist, CSIR-CFTRI and his students Deepesh Panwar and Shubhashini A. The research was undertaken as a part of Academy of Scientific and Innovative Research.

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