

Brazilian scientists develop functional bread that could help prevent asthma

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Researcher Ana Paula Carvalho (left) making dough enriched with microcapsules of *S. cerevisiae* UFMG A-905 (bottom right). Credit: Ana Paula Carvalho

Brazilian researchers have developed functional bread with the potential to prevent asthma, a respiratory disorder responsible for some 350,000 hospitalizations per year in the SUS (Sistema Único de Saúde), the nation's public health care network.

The formulation, for which a [patent application](#) has been filed in Brazil (BR1020210266465), is described in an article [published](#) in the journal *Current Developments in Nutrition*. It contains *Saccharomyces cerevisiae* UFMG A-905, a strain of brewer's [yeast](#) with probiotic properties that has been shown to attenuate the symptoms of [asthma](#) in mice. Further trials involving human volunteers are still required.

One of the most common diseases in the world, asthma is increasingly frequent and affects some 20 million Brazilians, according to the database maintained by the Ministry of Health (DATASUS). It is characterized mainly by airway inflammation and hyperresponsiveness. Its exact causes are poorly understood, but it is known to be associated with environmental irritants, diet, and gut microbiota, among other factors.

Asthmatic patients can benefit from ingestion of probiotics thanks to the link with gut microbiota. These [beneficial bacteria](#) are typically administered on their own or blended with [dairy products](#) such as milk, yogurt and kefir, but nothing prevents the use of other vehicles, which is advisable for patients who suffer from lactose intolerance or milk protein allergy.

In this study researchers at the University of São Paulo (USP) included *S. cerevisiae* UFMG A-905 in naturally fermented [bread](#) for the first time. Groups at the State University of Campinas (UNICAMP) and the Federal University of Minas Gerais (UFMG) collaborated on the project.

To assess its potential, the researchers tested and compared three types of bread. The first was fermented with commercial yeast, the second with *S. cerevisiae* UFMG A-905, and the third with *S. cerevisiae* UFMG A-905 plus microcapsules containing live *S. cerevisiae* UFMG A-905.

"We added encapsulated live yeast in order to improve probiotic viability

and activity at the high temperature reached during the baking process," said Marcos de Carvalho Borges, last author of the article and a professor in the Department of Clinical Medicine at the Ribeirão Preto Medical School (FMRP-USP). "Microcapsules protect bioactive and probiotic compounds, improving their stability, survival and bioavailability."

Mice with asthma were fed the different types of bread for 27 days. At the end of the experiment, the mice fed *S. cerevisiae* UFMG A-905 bread displayed less airway inflammation and lower levels of asthma biomarkers (interleukins 5 and 13, or IL5 and IL13, which are proteins secreted by the immune system).

In mice fed the bread containing microencapsulated yeast, airway hyperresponsiveness and levels of IL17A, another biomarker of asthma, were also reduced. These results were similar to those of previous studies, confirming that live *S. cerevisiae* UFMG A-905 can help prevent asthma.

"We found that both types of bread fermented with *S. cerevisiae* UFMG A-905 prevented the development of asthma in the mice, which in conjunction with the results of other experiments shows that this yeast has highly consistent effects and appears genuinely capable of combating this respiratory disorder," Borges said.

Next stage: Clinical trial

While acknowledging the limitations of the study, such as not including bread fermented with commercial yeast plus microcapsules and not assessing the survival of *S. cerevisiae* UFMG A-905 microcapsules after baking, the scientists believe they can now take the next step, which will consist of developing a protocol for a clinical trial to observe the effects of the yeast on human beings.

"The product has significant potential," Borges said. "Bread is a natural food consumed by almost everyone including children. It's easily distributed and has a good half-life on the shelf."

More information: Ana Paula Carvalho Thiers Calazans et al, A Functional Bread Fermented with *Saccharomyces cerevisiae* UFMG A-905 Prevents Allergic Asthma in Mice, *Current Developments in Nutrition* (2024). [DOI: 10.1016/j.cdnut.2024.102142](https://doi.org/10.1016/j.cdnut.2024.102142)

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