Old recipe making a come back

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Humans ate sourdough bread in ancient times and it's remained a traditional part of the diets in some countries and regions. Now Baltic scientists have reinvented this centuries-old technique for the needs of the food industry during a three-year long EUREKA project.

Many European supermarkets offer loaves from around the continent - from the French baguette through to the Italian ciabatta and Germany's dark pumpernickel. But ironically, despite the variety, many consumers are turning back to local bakeries or even rolling up their sleeves to make their own bread at home like some of their grandparents. This new trend doesn't surprise food scientist Professor Grazina Juodeikiene who thinks we are searching for the kind of flavour and texture often sacrificed during industrial bread-making. She headed a three-year EUREKA project, which found a way to deliver taste while maintaining a long shelf life.

The Lithuanian scientist first began thinking about bread when a foreign company arrived in her country to teach local bakers how to bake bread types such as the popular baguette. "It was excellent but the next day you could play baseball with it," she jokes. "My idea was to develop bread with what I now call the big 5: longer shelf life, better flavour, better texture, with more dietary fibre and fewer additives."

Perhaps the most surprising thing about the project FERMFOOD is that Juodeikiene's team has found ways to meet the needs of modern consumers by drawing on an ancient bread-making technique. As in the other Baltic countries, Lithuanians still eat sourdough bread - a tangy

tasting bread that uses a natural leavening method, which some trace back to the ancient Egyptians.

Ancient art

The leavening technique was replaced in many countries by industrially processed yeast and food additives, but sourdough bread has continued to be the main staple in the Baltics and some other regions of the world. In sourdough, the secret ingredient is a "starter" or "mother" of flour and water that ferments when a lactobacillus bacteria culture is added. That starter gives the lightness to the dough. This living culture is fed and preserved for use in successive loaves and often passed down through the generations.

In Lithuania, however, for many years, bakers relied on starters developed abroad. Juodeikiene felt it was time for Lithuania to have its own mother dough, produced through carefully developed know-how. During the project FERMFOOD, food scientists and technologists at the Kaunas University of Technology in Lithuania, the largest technical university in the Baltic States, gathered samples of the lactobacillus cultures from bakeries in the country. Given the importance of sourdough rye bread to the Baltic States, the researchers joined up with others in their field from Latvia and Estonia.

Winning approval to run a EUREKA project was a coup for researchers from a region with less experience of European research schemes. "It's often very difficult for new joiner countries like Lithuania to secure funding for research and application procedures need to be simplified for small companies from villages," says Juodeikiene.

Mould-resistant

Her three-country team analysed the different forms of cultures and explored which factors affected the sourdough bread and when it would go mouldy. Juodeikiene used cutting-edge equipment, which allowed her to test the texture of bread. Through using acoustic waves, the researchers were able to repeat their tests on the same slice of bread, since the equipment kept the slices intact. As they learnt more about the different lactic acid bacteria strains they were able to develop better effective cultures to produce more long-lasting bread they were able to test out their findings in the working bakeries.

The quest for the perfect loaf was full of painstaking research and sometimes unexpected results in the bakeries. Starters are affected by high temperatures in bakeries and the equipment used by different bakeries also affected the results. Nevertheless, some of the FERMFOOD loaves turned out to have shelf lives of three weeks and were mould-free.

Since the project finished, scientists from Kaunas University have been advising bakeries and businesses on fermentation products. The results are clear. The bakery UAB Alytaus Duona won two gold medals in 2008 and 2009 for its bread. Project partner UAB Ustukiu Malunas is now selling fermentation products commercially that were developed during FERMFOOD. In an age where people are trying to eat more healthily, sourdough bread-making is attractive. The method is ideally suitable for making rye bread - which has lower calories than many other types, as well as containing more dietary fibre – since baker's yeast does not work well as a leavening agent with rye flour.

Feeding the world

FERMFOOD results have even attracted interest from outside Europe, with Lithuania's Japanese embassy paying a visit to Juodeikiene's laboratory to learn more about it. Juodeikiene is not just sitting back and

savouring the success of the project, however. Having improved the quality of sour dough bread, she thinks it is time to improve the grain that produces it. "The next big challenge is how we feed a growing world population," she says. "We have no option but to intensify crop production."

She thinks that the discoveries made in FERMFOOD can be applied to produce grain that is resistant to rotting, which would allow for intensified crop production without harming the environment. "What was so nice about FERMFOOD is how practical it was and that I see such a future in this research," she says.

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