

Research for more flavor and taste

SCIENTISTS ARE STRIVING TO IMPROVE THE FLAVOR AND THE TASTE OF BAKED GOODS. RESEARCHERS FROM BREMERHAVEN, GERMANY, RECENTLY INTRODUCED NEW APPROACHES



✚ “Technology can significantly improve the taste and the flavor of baked goods!” With these words Prof. Dr. Klaus Lösche, head of the ttz Bremerhaven, opened a practical seminar titled “More taste with innovative fermentation” that took place the beginning of May 2010 in Bremerhaven. According to Prof. Dr. Lösche, fermentation plays a major role as today’s flour is low in enzymatic activities. Therefore, the entire seminar day was dedicated to different fermentation technologies: The novel MikroTec ultrasonic wetting process was compared to traditional proofing interruption and the participants learned how to bake with bakery ferments.

Firstly, Prof. Dr. Lösche gave an insight into the microbiological metabolism which is fundamental for the fermentation processes; the selection of microorganisms is decisive for the baking result because of their enzymatic activities. In this context the researchers also investigated rice sourdough as a possible alternative for gluten-free baked goods for people suffering from coeliac disease. An improvement in baking properties and taste would also improve the acceptance of such products by the consumers. A microbial phytase grown in a rice sourdough increases the acidity and lowers the pH. Both features are beneficial for the fermentation and the enhancement of the baking performance. Bread made with phytase-containing rice sourdough made at the ttz developed a dark color and a characteristic odor (no smell of rice). Other sensory properties were an elastic crumb, good sliceability and distinct freshness. According

to Prof. Dr. Lösche, calcium ions are expected as activators for alpha-amylase and, together with copper for the Maillard reaction.

The MikroTec ultrasonic wetting process can be applied to all kinds of proofing control. Here aerosols, which are very tiny water droplets, are discharged via a humidifier. As the temperature difference between the droplets and the environment is rather small, both readily blend with each other. A free floating fog emerges with very high humidity values of up to 99% and the products are quickly and gently cooled down or warmed up. At the same time the product does not lose too much of its own moisture thus preventing drying out, and flaking of the crust and irregular thawing. The ▶

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MikroTec process is energy efficient as only small amounts of energy have to be introduced. As a rule of thumb, the energy savings will be about 30%, said Prof. Dr. Lösche.

Another alternative for flavor improvement is the use of waste bread. The bakery, Andresen & Sohn from Neumünster, Northern Germany, produces baking syrup from scrap bread which in turn generates typical flavors. It is used in rusks, for example, as a substitute for glucose syrup. For the production of the baking syrup, the fresh waste bread is enzymatically liquefied and saccharified followed by common fermentation with subsequent pasteurization and drying. This product is used in industrial bakeries (e.g. Harry-Brot, Schenefeld or Henry Lambertz, Aachen, both Germany) as a precursor for the fermentative conversion of amino acids, eg. arginine or ornithine, in sourdough. This opens up the door for novel applications in bread, rolls and wafers as a substitute for sugar and flour or for flavor development in a pre-ferment.

The next lecturer, Dipl.-Ing. Thomas Lepold, General Manager of BackNatur Lepold GbR, Oberursel, Germany, explained the principles of a bakery ferment. This is an alternative leavening agent based on honey and salt; it contains no yeast. As this seminar was a practical seminar, the afternoon was dedicated to several baking trials. Different types of bread, including whole grain and baguettes, were produced with the use of the bakery ferment. These products were then compared with bread and baguettes made with baker's yeast (the wheat starter "Le Chef" by Ernst Böcker, Minden, Germany) and with rolls made with added phytic acid. The MikroTec process was also compared to the traditional proofing interruption method. Clear differences were determined with small baked goods – rolls made with the MikroTec process displayed a higher amount of small surface cracks and had a darker color than the traditionally produced rolls. Baguettes made with bakery ferment had a more open pore pattern than baguettes made with yeast. +++

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Comparison of wheat rolls made with traditional proofing interruption and MikroTec ultrasonic wetting!

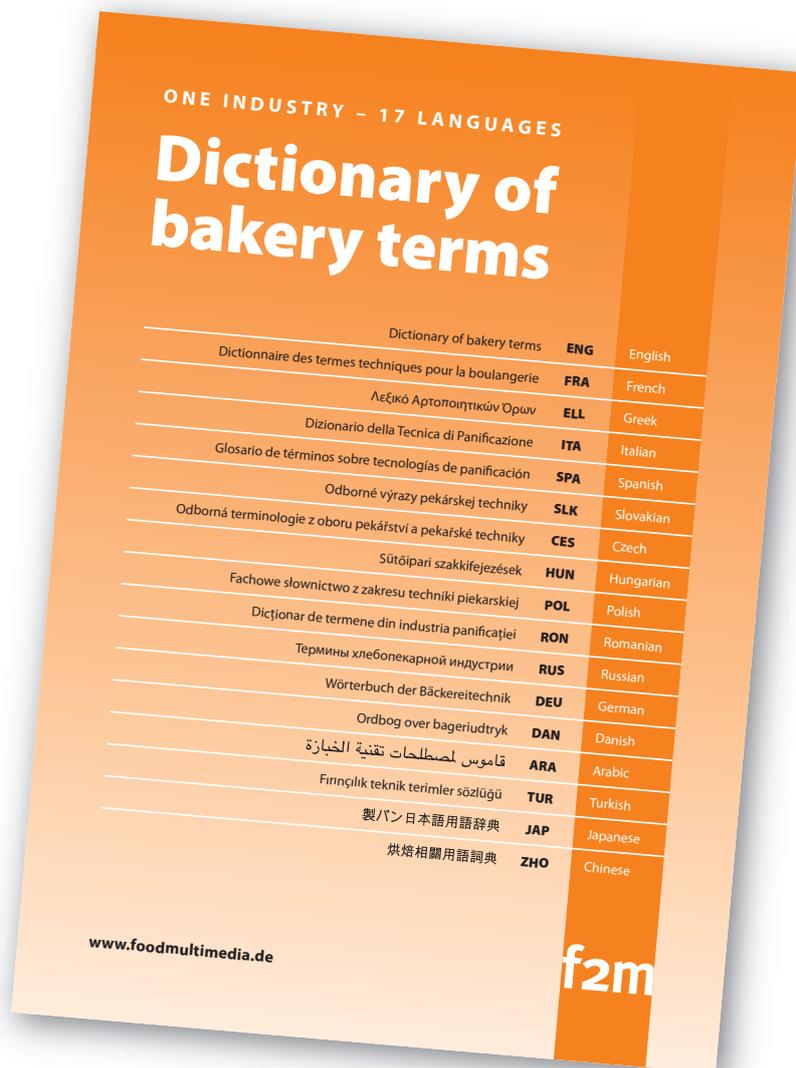
++ figure 3

Sensory evaluation of different baked goods



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