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Competence for gluten-free doughs

When a machine manufacturer such as FRITSCH and a fiber specialist such as JRS cooperate on application tests for gluten-free doughs or, more precisely, gluten-free croissants, this creates added value because the processes are examined from both perspectives – the machine side and the formulation side.

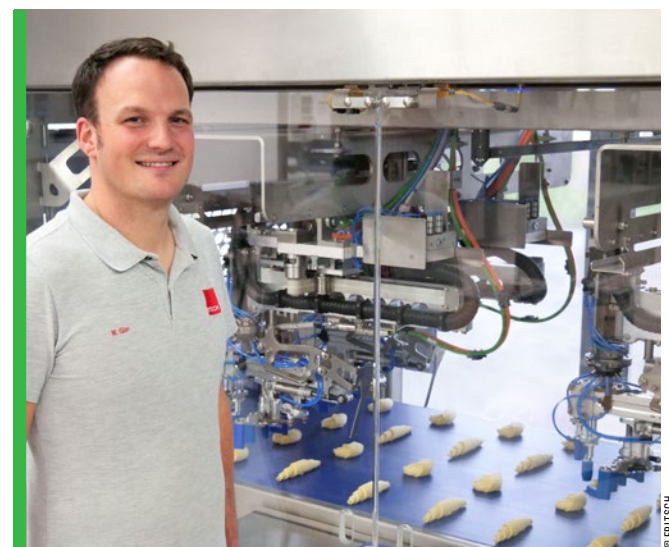
By Helga Baumfalk

+ Gluten-free doughs behave differently from wheat doughs. Gluten-free doughs are often very short, which makes processing more difficult. This issue is evident when it comes to the automated production of gluten-free croissants. The doughs must be rolled out in relatively thin sheets that must not tear during production. For this reason, the raw material hydroxypropylmethylcellulose (HPMC) is often used, because it mimics the functionalities of gluten and thus makes the dough less sensitive to tensile stress.

At J. Rettenmaier & Söhne (JRS) in Rosenberg/Germany, they are very familiar with plant fiber and its use in gluten-free doughs: "We knew that our gluten-free croissants were close to the regular croissant in terms of taste, volume and typical crumb structure. However, what we were still missing, was proof that our gluten-free croissant dough allows automated processing without loss of quality," explains Richard Lau, Global Business Line Manager Bakery and Confectionery at JRS.

To clarify this, bakery machine manufacturer FRITSCH came into play. "We have already gained extensive experience in the use of gluten-free doughs on our machines. It was important to us to expand our expertise in this area and to clearly focus on quality," says Michael Gier, dough technologist at FRITSCH and responsible for the World of Bakery (WoB), the company's baking technology center. "We wanted to produce a high-quality gluten-free butter croissant that could come very close to a French original with its typical

honeycomb structure. This is exactly where the difficulty lies with gluten-free croissants. They are often compact in the crumb, rather cake-like, and the individual layers are no longer recognizable at all."



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"In the application tests with gluten-free doughs, our focus was on quality. We wanted to produce a high-quality gluten-free butter croissant that could be very close to a French original."

Michael Gier, Manager World of Bakery and Dough Technologist, FRITSCH

Of course, the quality of gluten-free baked goods is largely determined by the raw materials. But, it makes a big difference whether the doughs are run through a small sheeter or an industrial system. "If you switch to industrial mode," says Lau, "adaptation problems arise quite naturally. You should know these pitfalls. And the best way to learn about them is to work closely with a machine specialist."

"Always with a focus on quality"

For the tests, the technicians and technologists from FRITSCHE and JRS came together at the FRITSCHE World of Bakery in Kitzingen/Germany. Test runs were made and the machines adapted until everything fitted. "As I said, always with a focus on the end product quality," emphasizes Michael Gier. "The knowledge alone that the gluten-free doughs were machine-compatible was not enough for us."

The test series started on the IMPRESSA croissant industrial line, which produces croissants at a rate of up to 150 cycles/min. Thanks to the unique CCT punch-turn unit, the

triangles are punched and turned in a single process step. This achieves excellent shape, position and weight accuracy. The croissants were then wrapped using a special vacuum wrapper, which ensures a precise wrapping process. "After



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achieving very good results on our largest line, we moved to the smaller machines such as the MULTIFLEX L and finally the MULTIFLEX M. We wanted to get an idea across all sizes, even with semi-automatic processing, of how to best design our lines for gluten-free doughs. The MULTIFLEX L in particular, with its flexibility, is the optimal machine when customers want to produce a wide range of croissants and pastries."



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"The added VIVAPUR® BCS 200 simultaneously makes the croissant a source of fiber and improves the Nutri-Score."

Richard Lau, Global Business Line Manager Bakery and Confectionery, JRS

Reduce drop heights, wrap loosely

The most important finding FRITSCH drew from the tests was that its own croissant lines can be used for gluten-free variants without major machine adaptation if the dough quality is appropriate. Says Gier, "With the short gluten-free doughs, you just have to make sure the drop heights are reduced wherever possible so as not to put any tension on the doughs in order to prevent them from tearing." He went on to add that a laminator can counteract this and achieve good lamination. "It is also important that the folding is gentle, without applying a lot of pressure." After the croissant

triangles are cut from the dough band, they are very lightly calibrated over the FRITSCH equipment and then loosely wrapped over the vacuum wrapper.

Richard Lau adds: "We found that the dough is handled with much more sensitivity when using a FRITSCH system than we can ever do with a small sheeter in our own bakery lab." Michael Gier can confirm this: "Manual sheeters work with a certain differential roller speed, for infeed and outfeed, which can be adjusted much more precisely on an industrial line."

The recipe is not rocket science

The recipe for the gluten-free croissants is no secret, explains Lau. "We give our customers the recipe and its process parameters. Usually, 50- or 100-percenters are the rule for gluten-free products; our product VIVAPUR® BCS 200* is added at 10.7% in total. In principle, we only supply the 'functionality'; the user can vary the other recipe ingredients at their own discretion."

Fiber source and improved nutri-score

For JRS, 'better-for-you' products are currently a big topic. Richard Lau: "We reformulate recipes in such a way that the quality remains unchanged, but the product brings added nutritional value. Incidentally, this is also the case with the gluten-free croissants. The added VIVAPUR® BCS 200* simultaneously makes the gluten-free croissant a source of dietary fiber and improves the Nutri Score." +++

**VIVAPUR® BCS 200 consists of rice starch, rice fiber, citrus fiber and hydroxypropylmethylcellulose (E 464).*

Gluten-Free: International Symposium in Rome

Rome/Italy will host the sixth International Symposium on Gluten-Free Cereal Products and Beverages from October 18-20, 2023. The symposium is hosted by the Food and Nutrition Research Center of CREA, the Italian Council for Agricultural Research and Economics, and co-organized by ICC (International Association for Cereal Science and Technology). More info can be found via this link or QR code: www.gluten-free-symposium.com/en

