

Sustainable production of healthy bread prototypes for the mass retail market



APPLICANT

- ALBA-KENYÉR Sütőipari Zártkörűen működő Részvénytársaság (<https://albakenyer.hu/>)

K+F PARTNERS:

- Campden BRI Hungary Nonprofit Ltd (<https://www.campdenbri.hu/en/en-magyarorszag.php>)
- Seacon Europe Ltd (<https://www.seacon.hu/en/>)
- Rubin Information Technology Plc (<https://www.rubin.hu/kezdokepernyo>)

Time and place of implementation: 2016-2019, Alba-Kenyér Zrt, Székesfehérvár

As the beneficiary of the project implemented within the framework of Széchenyi 2020 with the support of the European Union, Alba-Kenyér Zrt. By reducing and eliminating operating and technological losses, it became fully possible to compensate for the additional costs of salt substitutes and dietary fiber used to increase fiber content by the end of the project.

The recipes were developed with the involvement of the R&D partner Campden BRI Magyarország Nonprofit Kft (CBHU). Various natural salt substitutes and technological solutions as well as soluble and insoluble dietary fiber of natural plant origin suitable for increasing the fiber content were pre-tested for the development samples. The prototypes were made at the site of implementation, in the Székesfehérvár plant of Alba-Kenyér Zrt. (AK) and were selected from samples produced under industrial conditions. The development of the production food safety (HACCP) plan and the consumer testing of the selected samples was performed by sensory testing by CBHU.

The exploration of the loss points of industrial bread production and the identification of savings opportunities took place after the inclusion of the technological flow chart, together for several loss sources (raw material and energy losses, and labor utilization). The insufficiently measured or regulated technological processes have been identified, the method and possibility of measuring the missing parameters have been developed.

Technological parameters and material flow are monitored by a networked, intelligent sensor-based data acquisition, processing and analysis IT tool that generates regular automated reports to managers and alerts to operations personnel to continuously maintain optimization results.

The wireless sensor system was delivered by Rubin Information Technology Plc. delivered, the decision support information platform is provided by Seacon Europe Ltd.

RESULTS

- 1. Breads with 25% lower sodium content and 25% increased fiber content*
- 2. The same sensory profile and consumer preference as the Hungarian Food Book bread*
- 3. Same production cost as before by eliminating sources of material, energy and labor losses*
- 4. IT tool for data collection, processing and analysis with alerts and automatic reporting for sustainability of results*

DATA COLLECTION AND DATA ANALYSIS MEASUREMENT SYSTEM

The entire technology line equipped with an intelligent sensor network can provide long-term data on the environmental and technological parameters necessary to optimize the production process. Its application is not limited to a product, so it makes it possible to carry out research on other prototypes as well. It is an IT tool based on objective measurements, providing monitoring and controlling services, which includes the professional knowledge of the baking industry, supervises the production, analyzes and evaluates the measurement results, qualifies based on the built-up rule system, and sends warnings to the professionals if necessary. It ensures product traceability.

The IT support system for the production of products makes the traditional production process digitally processable. The knowledge of the food industry, which facilitates the production of a new healthy product, has been incorporated, but at the same time, it can be extended to other production equipment and other products as well. The developed methodology and the integrated tool base are flexible in terms of later applicability, as it is possible to connect newer sensors and measuring devices. The central processing and control application can be parameterized from the outside, so its functionality can be linked to the user, and specific analyzes and queries related to measuring devices and, where applicable, the production of different products can be handled with good flexibility by organizing the data of the processing center into data markets.

THE POSSIBILITIES OF THE FUTURE

During the analysis, several possibilities were revealed. Due to the duration and scope of the project, as well as the complexity of the tasks and opportunities, the measurement systems and data collection methodologies selected for implementation were not necessarily done according to the appropriate priorities, and did not cover all cost reduction options. In the future, these can be expanded in the framework of a new project with other data collection locations, such as the mixing of sourdough, whose composition and ripening process we have now taken as constant, even though, as it turned out later, the parameters of the technological process used for other analysis can be influenced to varying degrees.