

EU-FRESHBAKE

Fresher bread on the shops with improved nutritional quality and energy savings

An innovative concept of baking oven has been developed by the EU-FRESHBAKE European research project. The concept is based on infrared technology and has been developed with the objective of saving energy compared to a conventional baking oven while maintaining at the same time high quality level of freshness. The EU research project EU-FRESHBAKE was supported by the European Commission Sixth Research Framework Programme with 2 million Euro; the project focused on all the domains of industrial baking and in particular on back off technologies, which allow to sell fresh baked bread made from frozen products. Specialties such as gluten free bread have also been considered.

EU-FRESHBAKE focused on the bake off technology, which consists in preparing bread from semi finished products which are most of the time made at industrial scale (but also by craft bakers). Most emblematic products are the frozen fully baked bread, the frozen (or non frozen) part baked bread and the non-fermented frozen dough. Preparation times are respectively 30 min, 1 hour and 3 hours. One can find these products in baking stations (shopping mall, train station, small supermarket...) or even in craft bakeries.

EU-FRESHBAKE developed a special infrared oven based on targeted pre-heating functionality. Tests have been done to compare the energy consumption in comparison with a similar electric oven. A reduction by around 30% of the energy (not including steaming) and of around 70% of the pre-heating times have been obtained with a higher installed power for the infrared oven. A patent has been filled in France in July 2009 and is at present under extension to selected countries. Industrial partners are searched to market the oven. The concept, which can be installed also in the existing ovens, is based on the same principle as conventional oven: preheating followed by baking. The difference comes from the efficiency in heat transfer. Instead of heating the whole body of the oven, the energy is applied only where it is demanded; the energy savings come from reduced losses to the ambience thanks to the concept. Further developments are carried out in particular for the process control and the operation of the oven in the case of a baking station or of a bakery.

The project also makes available another energy saving oven system based on vacuum baking using low pressure. Partial baking is made at lower temperature resulting in lower bread volume. This technique is efficient in case of partial baking of bread and permits to save energy (because of the lower baking temperature). In addition, the bread volume is higher and the water losses during baking are reduced (respectively + 30% and -30 to -50% vs. conventional). The exposure of the fermented dough to a reduced ambient pressure results in an expansion of the dough. The stabilization of the dough (dough to crumb transition) is then obtained via a conventional heat transfer.

Another very important finding was on the impact of baking condition on the glycaemic index (GI). The GI gives information on the glycaemic response (sugar in the blood) after eating a food. The reference value is 100 in the case of a glucose solution. Tests have been done with healthy volunteers. It has been shown that frozen part baked bread had a significant lower GI than conventional breads. This was explained by the fact that starch granules (which contain carbohydrates) are less affected in the case of partial baking. In combination, the freezing process tends to provide to starch a better resistance to digestion. This is related to major health problems such as obesity and diabetes type 2 problems. Obesity is often related to a combination of high glycaemic foods and an excess of lipids in the gut. Conferring low GI permits to reduce the energy intake and contributes to a reduction of the body mass index. An important outcome of the project is that breads sold in bakery or in

baking stations (which use bake off technology) are not accompanied by any information or nutrition facts on a label. Most breads developed during EU-FRESHBAKE might be able to support nutrition claims such as “source of fibers”, “high fibre”, “source of proteins”, or “low glycaemic index food”.

Fresh bread represents 73% of the EU-27 tonnage bread production (data of 2006 - Girafood). However, the bake off technology is growing fast (10 to 20% per annum), in particular in EU-15, whereas fresh packed bread is the growing market in the 12 New Member States. The market is growing at a much higher level than any other bakery products (between 10 and 20% per annum). Even though frozen part baked bread demands roughly 2.2 times more energy than conventional direct baking (not considering frozen transport and frozen storage), it offers the unique advantage to prepare the bread on demand and finally to reduce the leftover breads.

Website: <http://eu-freshbake.eu/eufreshbake/>

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