

Impact of innovative processes on the nutritional and structural quality of Mediterranean flat bread

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Bread is a staple food, often consumed daily in particular in the Mediterranean area in the case of flat-bread. The high consumption of bread may address health issues. The glycaemic index (GI) of flat-bread has been minimally investigated so far in the existing literature. High GI foods may contribute to several diseases linked to metabolic syndrome. Another facet of flat-bread concerns is the high energy demand required for baking (300-500°C). The objective of this project is to unravel the links between baking conditions and GI, in order to reduce the GI and to better understand the link between GI and starch status. This approach will provide insight in the impact of the baking conditions on bread quality (nutritional and structure) in link with energy demand. In order to address these issues, the impact of the process for gluten flat-bread has been investigated considering partial baking as an alternative baking process.

The reference baking of flat bread was carried out at 350°C for 1 min, whereas the partial baking was done at 350°C for 30 sec. The part baked breads were frozen and stored at -18°C. The final thawing-baking of the part-baked flat-bread was done in a toaster before consumption. The texture, water content and amylopectin retrogradation of the control and part-baked bread were monitored during storage at room temperature to characterise the impact of the process on the staling of flat breads. The nutritional aspect was evaluated through a dual approach combining the determination of the GI (in vitro method) and the amount of non-gelatinized starch. Indeed, due to the high heating rate observed during baking, starch undergoes a partial gelatinisation resulting in a contribution to the reduction of GI. The impact of the partial baking process on the energy demand depends on the preheating energy and on the energy during baking. In the case of flat-bread, the energy for preheating of the oven is dominating showing the importance of the mode of baking. These results allow a better understanding of the impact of the baking process in the case of flat bread baking.