

Mitigation strategies of acrylamide and advanced glycation end-products in bread

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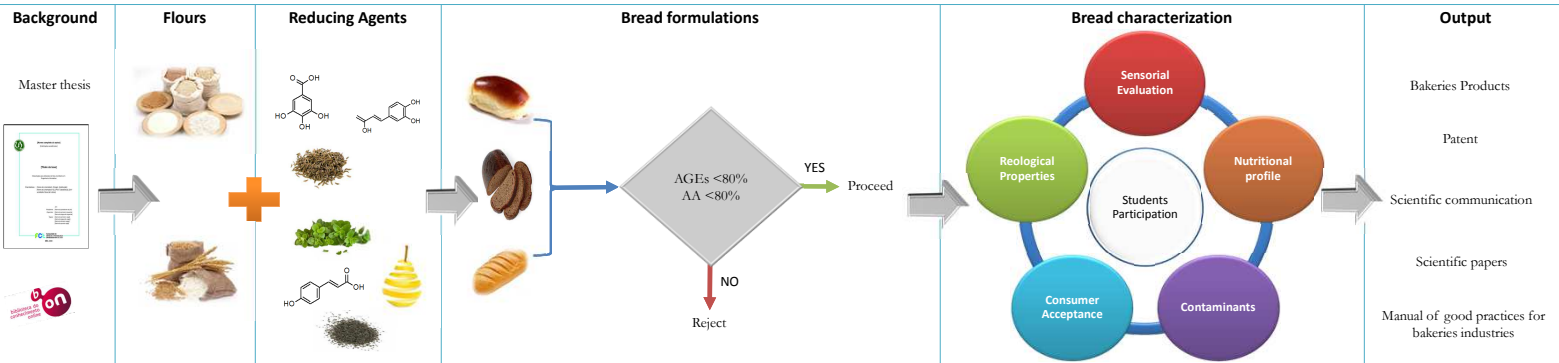
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GRAPHICAL ABSTRACT



INTRODUCTION

The Maillard reaction is responsible for color, flavor and aroma in food products, but it is also responsible for the production of toxic substances such as acrylamide (AA) and advanced glycation end-products (AGEs) [1]. Since the identification of acrylamide in 2002 in processed foods, reports have been conducted by the WHO and supported by EFSA scientific studies of great credibility. This contaminant is considered carcinogenic to animals and possibly humans and even neurotoxic and genotoxic [2,3]. The other product of the Maillard reaction, AGEs may lead to cardiovascular disease, diabetes, Alzheimer's disease and rheumatoid arthritis [4]. These two compounds can be formed in foods such as bread, cereals and pastries [3,4].

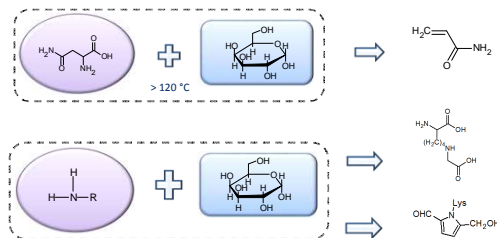


Figure 1- Acrylamide and advanced glycation end-products formation

OBJECTIVES

Although several studies have already been developed, aiming at strategies to reduce AA and AGEs in food during the Maillard reaction, there are few application studies in the bakery industry. Thus, the MISAGE focuses on the development of different combinations of ingredients extracts - acrylamide reducing agents (ARA) and national by-products to reduce AA and AGEs content in breads with high consumption by the Portuguese population: rye bread, wheat bread and sweet yeast bread. One important objective is also to integrate the students in almost the tasks.

CONSORTIUM

The consortium includes the participation of ESHTE – The Project Promotor, where the problem of the formation of harmful compounds to human health during bread baking process, specifically the rye bread, wheat bread and sweet yeast bread has to be dealt. Thus, ESHTE established a consortium between INSA and the IP Santarém to complement the technical and scientific components such as the extraction of phenolic compounds, evaluation of antioxidants, determination of precursors of AA and AGEs and rheological evaluation. Both ESHTE, and INSA together with IP Santarém involve highly skilled human resources to the project having large experience in the working areas of the project which is considered to be suitable for the project's success.



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PROJECT ACTIVITIES

