

Meeting abstract

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The potential antimutagenic and antioxidant effects of Maillard reaction products used as "natural antibrowning" agents

Stefanie Reichhold*, Karin Koschutnig and Karl-Heinz Wagner

Address: Department of Nutritional Sciences, University of Vienna, Austria

Email: Stefanie Reichhold* - stefanie.reichhold@univie.ac.at

* Corresponding author

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The aim of this study was to identify the potential antioxidative and antimutagenic effects of Maillard reaction products (MRPs) formed from glucose or fructose and cysteine or glutathione in the AMES test. The samples were partly based on a study by the Conservatoire national des arts et métiers, Chaire de biochimie industrielle et agro-alimentaire, Paris, where their influence on the inhibition of polyphenoloxidase had been investigated. The mixtures were heated for 4 h 20 min or 14 h at 103°C or 110°C and tested from 0.05 to 11 mg/plate in the strains TA98 and TA102 in the plate incorporation assay. In order to promote the formation of mutant revertants the prooxidants hydrogen peroxide (H₂O₂) and tertiary-butyl hydroperoxide (tBOOH) were used in the TA102. Tests were conducted with preincubation as well as with and without metabolic activation. In the TA98 there was no effect shown. In the TA102 the shorter heated samples (4 h 20 min) were more active than the longer heated (14 h). Up to 1 mg/plate (1%) all reaction mixtures remained safe, but the 5% and in particular the 11% fractions increased the number of revertants significantly for the shorter heated mixtures. The 14 h mixtures remained safe for almost all concentrations. No significant difference could be observed between the cysteine and glutathione mixtures, the fructose mixtures increased revertants number significantly more than the glucose mixtures only in the 4 h 20 min heated mixtures for the highest concentration (11%). The highest activation was always observed for the +S9 tests. Antioxidative effects were higher in the 4 h 20 min heated samples.