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Use of asparaginase in reducing free asparagine formation in coffee beans

A.C.V. Porto[1], L.M.F. Gottschalk[2], E.F. Souza[2], E.M. Penha[2], O. Freitas-Silva*[1,2]

[1]Food and Nutrition graduated Program - UNIRIO,, Brazil, [2]Embrapa Food Technology, Brazil

Acrylamide has been considered potentially carcinogenic and neurotoxic substance formed when carbohydrate-rich foods are fried, baked or roasted above 120 °C. The World Health Organization established the daily consumption limit of this substance at 1 mg/kg body weight/day of acrylamide or 60 mcg, considering a body weight of 60 kg. Asparagine is evidenced as the primary amino acid involved in the Maillard reaction as a key precursor in the acrylamide formation mechanism. For this reason, recently asparaginase enzyme has been used to reduce the formation of acrylamide, since it was used to converts asparagine to aspartic acid precursor and ammonia. In this work analysis was conducted to verify the influence of pretreatment arabica and robusta green coffee with steam and loads with different asparaginase enzymes. The results showed the effectiveness of the enzyme asparaginase (Acrylaway CB L) in the reduction of free asparagine in both Arabica as the Robusta green coffee beans. With the enzimatic level of 3000 ASNU, the best steam pre-treatment obtained was 30 minutes for arabica samples and 45 minutes for robusta ones, reducing 40% and 30% of de asparagine, respectively. Results obtained can be attributed to the difference of chemical composition from both species.

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