Acrylamide formation in vegetable oils and animal fats during heat treatment

ABSTRACT

The method of liquid chromatographic tandem mass spectrometry was utilized and modified to confirm and quantify acrylamide in heating cooking oil and animal fat. Heating asparagine with various cooking oils and animal fat at 180 °C produced varying amounts of acrylamide. The acrylamide in the different cooking oils and animal fat using a constant amount of asparagine was measured. Cooking oils were also examined for peroxide, anisidine and iodine values (or oxidation values). A direct correlation was observed between oxidation values and acrylamide formation in different cooking oils. Significantly less acrylamide was produced in saturated animal fat than in unsaturated cooking oil, with 366 ng/g in lard and 211 ng/g in ghee versus 2447 ng/g in soy oil, followed by palm olein with 1442 ng/g.

Keyword: Acrylamide; Animal fats; LC–MS/MS; Oxidation values; Vegetable oils