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Dietary patterns and exposure to acrylamide using data from the UK Women's Cohort Study

L. K. Fraser¹, S. J. Hepworth¹, V. J. Burley², P. A. McKinney¹, T. de Kok³, S. van Breda³, S. Kyrtopoulos⁴, M. Botsivali⁴, J. Kleinjans³ and J. E. Cade²

¹Paediatric Epidemiology Group, Division of Epidemiology, University of Leeds, LS2 9JT, UK, ²Nutritional Epidemiology Group, Division of Epidemiology, University of Leeds, LS2 9JT, UK, ³Department of Health Risk Analysis and Toxicology, University of Maastricht, The Netherlands and ⁴National Hellenic Research Foundation, Athens, Greece

The International Agency for Research on Cancer classified acrylamide as probably carcinogenic in human subjects in 1994⁽¹⁾. In 2002, acrylamide (AA) was found to be present in significant amounts in human foods, especially starchy foods cooked at high temperature, e.g. crisps and fried potatoes⁽²⁾. There is good evidence that acrylamide is carcinogenic and neurotoxic in rodents^(3,4), but the epidemiological studies looking at the association between AA and cancer in human subjects have generated conflicting results.

The United Kingdom Women's Cohort Study (UKWCS) was established in 1993 to investigate the associations between diet and cancer in the UK⁽⁵⁾. This analysis aimed to describe the acrylamide intake in this cohort of middle-aged women and relate this intake to specific dietary patterns which were derived from the analysis of food frequency questionnaire data collected at the study baseline.

Using dietary data from 35 372 cohort participants, the mean intake of AA was estimated as 0.253 µg/kg/d (95% CI 0.252, 0.255). This is less than the safe recommended level of 1 µg/kg/d. The most important source of acrylamide in the UKWCS study was potato chips, which contributed an average of 29% to total exposure. The other main food sources of acrylamide were bakery goods (17.5%) and potato crisps (15.7%). Older women, those who smoked and women with lower education levels had a higher average mean intake of acrylamide from dietary sources.

Meat eaters had higher average acrylamide intakes than vegetarians, fish and poultry eaters. Lower acrylamide intakes were found with increasing WHO healthy eating index and Mediterranean diet scores. The sources of acrylamide varied by dietary pattern group with the healthier WHO scores are obtaining less acrylamide from potato crisps and more from crispbread.

This descriptive study of acrylamide intake has shown that although the mean intake of AA in this cohort is less than the tolerable daily intake there are significant differences of intake within this population. The public-health messages regarding which foods to reduce the intake of in order to decrease acrylamide intake should be specific for people with different dietary patterns within the UK.

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