

Irish Section Meeting, 16–18 June 2010, Nutrition – Getting the Balance Right in 2010

N^{ϵ} -(carboxymethyl)lysine and N^{ϵ} -(carboxyethyl)lysine content of foods commonly consumed in a Northern Irish diet

G. L. J. Hull¹, J. V. Woodside², G. J. Cuskelly¹ and J. M. Ames³

¹*Institute of Agri-Food and Land Use, School of Biological Sciences, Queen's University Belfast BT9 5AG, UK,* ²*School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast, Belfast BT12 6BJ, UK and* ³*School of Applied Sciences, Northumbria University, Newcastle-upon-Tyne NE1 8ST, UK*

The potential adverse health effects of diet-derived advanced glycation end-products (AGE) is of current interest, due to their proposed involvement in the disease progression of diabetic and uremic conditions⁽¹⁾.

Currently, accurate information about the levels of AGE in foods is lacking. The objective of this investigation is to determine the level of the AGE, N^{ϵ} -(carboxymethyl)lysine (CML) and N^{ϵ} -(carboxyethyl)lysine (CEL) in a wide range of foods commonly consumed in a Northern Irish diet.

CML and CEL have been measured in 262 foods and beverages. Individual foods were mixed, lyophilised, ground, reduced, fat-extracted, hydrolysed and underwent solid-phase extraction using a C₁₈ cartridge. Extracts were analysed by ultra-performance liquid chromatography-tandem mass spectrometry with the use of isotopically labelled internal standards and by reference to an external standard calibration curve⁽²⁾.

The table shows CML and CEL levels in a selection of foods.

Food Item	CML		CEL	
	(mmol/mol lysine)	SD	(mmol/mol lysine)	SD
Pork, sausages	1.84	0.05	1.34	0.02
Cod	0.04	0.002	0.03	0.002
White bread	6.95	0.59	3.11	0.19
Potato bread	1.35	0.01	0.46	0.004
Corn flakes	16.69	0.33	14.29	0.36
Muesli	3.86	0.13	1.93	0.008
Kit kat bar	35.02	0.63	5.48	0.19
Walkers crisps	1.42	0.35	1.04	0.19

This is the first time that CML and CEL levels have been measured in a comprehensive range of foods using a validated instrumental method.

1. Vlassara H & Palace MR (2002) Diabetes and advanced glycation endproducts. *J Intern Med* **251**, 87–101.
2. Assar SH, Moloney C, Lima M *et al.* (2009) Determination of N^{ϵ} -(carboxymethyl)lysine in food systems by ultra performance liquid chromatography-mass spectrometry. *Amino Acids* **36**, 317–326.