

Caroline Harris, Ph.D., CChem, FRSC
Practice Director and Principal Scientist

Professional Profile

Dr. Caroline Harris is a Principal Scientist and the Co-Director of the Health Sciences Center for Chemical Regulation and Food Safety. Dr. Harris worked for 15 years in the UK's Pesticides Safety Directorate with her latter posts being Head of Pesticide Chemistry and Manager of the Human Health Group. During this time she developed in-depth background knowledge of pesticides, including physical and chemical properties, methods of analysis, metabolism, residues, and consumer risk assessment particularly relating to Directive 91/414. She was the chair of the physical and chemical properties and residues ECCO working group meetings from 1996 to 2001 and was involved in the drafting of many of the guidance documents relating to these areas of the Directive. She acted as the UK's senior scientific negotiator to the European Union on Maximum Residue Limits of pesticide residues during 1991-2.

Dr. Harris has been a leading force in the development of guidelines for dietary risk assessment in the EU. She is a sought after speaker with a strong international reputation, who has given papers on a range of subjects from dietary risk assessment, environmental contamination by persistent compounds, infant and child exposure to pesticide residues and risk perception.

She was the scientific coordinator and chair of the joint EU/OECD initiative to develop minimum data requirements for establishing MRLs and import tolerances during 1998–1999. She also was a temporary adviser to the Joint Meeting on Pesticide Residues from 1999–2001. As a member of the UK's Pesticide Residues Committee (formerly the Working Party on Pesticide Residues) and the Sub-group on Future Priorities, Dr. Harris had primary responsibility for study design and implementation. She acted as Chair on a number of occasions in 1998–2000.

Dr. Harris acts as a technical consultant in pesticides and human exposure to a number of international bodies including FAO, WHO, the European Commission and the UK's Food Standards Agency and has been a member of the UK's Advisory Committee on Pesticides since 2009.

Academic Credentials and Professional Honors

Ph.D., Clinical Medicine, University of Leeds, 2004
M.Sc., Analytical Chemistry, University of London, 1990
The Royal Society of Chemistry Certificate in Applied Chemistry, Bristol Polytechnic, 1986
BTEC/HNC, Physical Sciences, Bristol Polytechnic, 1984
TEC, Physical Sciences, Brunel Technical College, Bristol, 1982 (Received college prize for meritorious achievement)

Publications

Kleter GA, Unsworth JB, Harris CA. The impact of altered herbicide residues in transgenic herbicide-resistant crops on standard setting for herbicide residues. *Pesticide Management Science* 2011; 67:1193–1210.

Katayama A, Bhula R, Burns GR, Carazo E, Felsot A, Hamilton D, Harris C, Kim Y-H, Kleter G, Koedel W, Linders J, Peijnenburg JGMW, Sabljic A, Stephenson RG, Kenneth Racke, Baruch Rubin D, Tanaka K, Unsworth J, Wauchope RD. Bioavailability of xenobiotics in the soil environment. In: *Reviews of Environmental Contamination and Toxicology*. Whitacre DM (ed), Springer Science+Business Media, LLC, 2010. DOI 10.1007/978-1-4419-1352-4_1.

Felsot AS, Unsworth JB, Linders JBHJ, Roberts G, Rautman D, Harris C, Carazo E. Agrochemical spray drift: Assessment and mitigation—A review. *Journal of Environmental Sciences and Health Part B* 2010; 45:8, 889–911.

Kleter GA, Harris C, Stephenson G, Unsworth J. Comparison of herbicide regimes and the associated potential environmental effects of glyphosate-resistant crops versus what they replace in Europe. *Pesticide Management Science* 2008 Apr; 64(4):479–488.

Kleter GA, Bhula R, Bodnaruk K, Carazo E, Felsot AS, Harris CA, Katayama A, Kuiper HA, Racke KD, Rubin R, Shevah Y, Stephenson GR, Tanaka K, Unsworth J, Wauchope RD, Wong S-S. Review—Altered pesticide use on transgenic crops and the associated general impact from an environmental perspective. *Pesticide Management Science* 2007; 63:1107–1115.

Kleter GA, Harris C, Stephenson G, Unsworth J. Comparison of herbicide regimes and the associated potential environmental effects of glyphosate-resistant crops versus what they replace in Europe. *Pesticide Management Science* 2007.

Ashwell M, Barlow S, Gibson S, Harris C. National Diet and Nutrition Surveys: the UK experience. *Public Health Nutrition* 2006 Jun; 9(4):523–530.

Kleter GA, Bhula R, Bodnaruk K, Carazo E, Felsot AS, Harris CA, Katayama A, Kuiper HA, Racke KD, Rubin B, Shevah Y, Stephenson GR, Tanaka K, Unsworth J, Wong S-S. Altered pesticide use on genetically modified crops and its consequences from an environmental perspective. *Pesticide Management Science* 2007; 63(11):1107–1115

Farrelly E, Harris C. Integration of probabilistic modelling within consumer and environmental risk assessments: Reporting, communicating and contextualising risks. *Proceedings, British Crop Protection Council International Congress*, pp. 655–660, Glasgow, UK, October 31–November 2, 2005.

Harris C. The development of harmonized data requirements for import residue limit establishment. *Proceedings, IUPAC-UCR-MAG International Workshop on Crop Protection*

Chemistry, International Union of Pure and Applied Chemistry, pp. 149–153, Costa Rica, February 14–17, 2005.

Kleter GA, Bhula R, Bodnaruk K, Carazo E, Felsot AS, Harris CA, Katayama A, Kuiper HA, Racke K, Rubin B, Shevah Y, Stephenson GR, Tanaka K, Unsworth J, Wong S-S. The effect of the cultivation of genetically modified crops on the use of pesticides and impact thereof in the environment. Proceedings, IUPAC-UCR-MAG International Workshop on Crop Protection Chemistry, International Union of Pure and Applied Chemistry, pp. 49–75, Costa Rica, February 14–17, 2005.

Harris CA, Gaston CPG. Effects of refining predicted chronic dietary intakes of pesticide residues: A case study using Glyphosate. *Food Additives and Contaminants* 2004; 21(9):857–864.

Hamilton D, Ambrus A, Dieterle R, Felsot A, Harris CA., Petersen B, Racke R, Wong S-S, Gonzalez R, Tanaka K, Earl M, Roberts G, Bhula R. Pesticide residues in food—Acute dietary exposure. *Pesticide Management Science* 2004; 60(4):311–339.

Harris CA, Hill ARC. Variability of residues in unprocessed food items and its impact on consumer risk assessment. *Pesticide Toxicology and International Regulation, Current Toxicology Series*, ISBN 0 471 49644 8. John Wiley and Sons, Chichester, UK, 2004.

Hamilton DJ, Ambrus A, Dieterle RM, Felsot AS, Harris CA, Holland PT, Katayama A, Kurihara N, Linders J, Unsworth J, Wong S-S. Regulatory limits for pesticide residues in Water (IUPAC technical report). *Pure Applied Chemistry* 2003; 75(8):1123–1155.

Kleter, GA, Bhula R, Carazo E, Felsot AS, Harris CA, Katayama A, Kuiper HA, Racke K, Rubin B, Sheva Y, Stephenson GR, Tanaka K, Unsworth J, Wong SS. Impact of transgenic crops on the use of agrochemicals and the environment. In: *Harmonization of Data Requirements and Evaluation*. Proceedings, IUPAC-KSPS International Workshop on Pesticides 2003, October 13–16, 2003, Seoul, Korea. International Union of Pure and Applied Chemistry and Korean Society of Pesticide Science, Daejeon, pp. 55–61.

Harris CA, Tomerlin JR. The regulation of pesticides in Europe. Directive 91/414. *Journal of Environmental Monitoring* 2002; 4:28–31N.

Harris CA, Woolridge MW, Hay AWM. Organochlorines pesticide residues in breastmilk—Difficulties in sample collection and assessing risk. *Food Additives and Contaminants* 2002; 19(6):547–554.

Harris CA, Woolridge MW, Hay AWM. Factors affecting the transfer of organochlorine pesticide residues to breastmilk. *Chemosphere* 2001; 43:243–256.

Harris CA, Renfrew MJ, Woolridge MW. Assessing the risks of pesticide residues to consumers: Recent developments and the future. *Food Additives and Contaminants* 2001; 18(12):1124–1129.

Harris CA. How the variability issue was uncovered: History of the UK residue variability findings. *Food Additives and Contaminants* 2000; 17(7):491–498.

Harris CA, Mascall JR, Warren SFP, Crossley SJ. Summary report of the international conference on pesticide residues variability and acute dietary risk assessment. *Food Additives and Contaminants* 2000; 17(7):481–484.

Hill ARC, Harris CA, Warburton AG. Effects of sample processing on pesticide residues in fruit and vegetables. *Principles and practices of method validation*, RSC proceedings series book, ISBN 0-85404-783-2. The Royal Society of Chemistry, Cambridge, UK, 2000.

Harris CA, O'Hagan S, Merson GHJ. Organochlorine pesticide residues in human milk in the United Kingdom 1997-8. *Human & Experimental Toxicology* 1999; 18:602–606.

Hamey PY, Harris CA. The variation of pesticide residues in fruits and vegetables and the associated assessment of risk. *Regulatory Toxicology and Pharmacology* 1999; 30:S34–41.

Reports

Harris CA, Hinchcliffe AC, Gaston CP, Ambuka V. Final report on the study on the actual intake of pesticides through food by consumers in the European Union. Report for the European Commission, in press.

Harris, CA, Gaston CP. A survey report to follow-up the development of the concept of minimum data requirements for establishing maximum residue limits (mrls) including import tolerances for pesticides.

http://www.fao.org/ag/agp/agpp/pesticide/jmpr/DOWNLOAD/survey_min_data_req_mrls.pdf. 2004.

Harris CA, Pim JH. Minimum data requirements for establishing maximum residue limits (MRLs) including import tolerances. Recommendations from the Scientific Workshop held at the Pesticides Safety Directorate, York, UK on 6-8 September 1999. Report prepared for the European Commission (doc. 2734/SANCO/99). http://www.europa.eu.int/comm/food/fs/ph-ps/pest/mindata_en.pdf. 2000.

Crossley SJ, Harris CA. The variability of residues levels and a proposed methodology for acute dietary exposure assessment. *Joint FAO/WHO Consultation on Food Consumption and Exposure Assessment of Chemicals*, Geneva, Switzerland, 1997.

Posters

Harris CA, Gaston CP. The effects of refining consumer exposure assessments of glyphosate. Poster at the British Crop Protection Council Conference, Glasgow, UK, 2003.

Harris CA, Hay AWM, Woolridge MW. A comparison of methodologies for assessing infant Intakes of *p,p'*-DDE and *p,p'*-DDT residues from breastmilk. Poster at the IUPAC Conference, Basle, Switzerland, 2002.

Harris CA, Woolridge MW, Burrell JA, Hay AWM. Longitudinal changes of organochlorine pesticide residues in breastmilk. Poster at the European Pesticide Residue Workshop, Rome, Italy, 2002.

Harris CA, Hamey PY, Crossley SJ. Variability of pesticide residues and acute risk assessment. Poster at the 9th International IUPAC Congress, London, 1998.

Presentations

Harris CA, Gaston CP. Consumer exposure assessment to pesticide residues in Europe. Proceedings, 8th European Pesticide Residue Workshop, Strasbourg, France, June 20–24, 2010.

Harris CA, Haenel R, Barker S. Technical specifications and registration of pesticides in the European Union. Proceedings, 3rd International Symposium on Pesticide and Environmental Safety and 7th International Workshop on Crop Protection Chemistry and Regulatory Harmonisation, Beijing, PR China, October 9–13, 2007.

Harris CA, Gaston CP. Current state of specialty crop programmes, initiatives and challenges. Proceedings, Global Minor Use Summit, Rome, Italy, 2007.

Harris CA, Gaston CP. Preparation and submission of Manufacturers Data Dossiers to JMPR. Proceedings, Global Minor Use Summit, Rome, Italy, 2007.

Harris CA. The European Union Programme for Harmonisation of Maximum Residue Levels (MRLs). Proceedings, 3rd International Symposium on Pesticide and Environmental Safety & 7th International Workshop on Crop Protection Chemistry and Regulatory Harmonisation, Beijing, PR China, (October 9–13, 2007).

Kleter GA, Shevah Y, Unsworth J, Alleluia IB, Bodnaruk K, Carazo E, Harris CA, Katayama A, Rubin R, Stephenson GR, Tiu C. Risk assessment and regulation of transgenic crops with a particular focus on pesticides applied to these crops. Proceedings, 3rd International Symposium on Pesticide and Environmental Safety & 7th International Workshop on Crop Protection Chemistry and Regulatory Harmonisation, Beijing, PR China, (October 9–13, 2007).

Harris CA. Advances in regulatory consumer exposure assessment to pesticide residues in Europe. Korea Conference on Innovative Science and Technology, Workshop for Risk Analysis, Jeju Island, Korea, 2004.

Harris CA. The EU harmonised monitoring and risk assessment programme for pesticide residues. European Pesticide Workshop, Stockholm, Sweden, 2004.

Harris CA. The EU harmonised monitoring and risk assessment programme for pesticide residues. 3rd International Fresenius Conference on Food Safety and Dietary Risk Assessment, Cologne, Germany, 2004.

Harris CA. Current approaches for chronic dietary intake assessment. IUPAC-Korean Society of Pesticide Science International Workshop on Pesticides, Seoul, Korea, 2003.

Harris CA. The availability of European consumption data. AgChem Forum – Dietary Risk Assessments – International Perspectives, London, UK, 2003.

Harris CA. Monitoring data in the risk assessment—A European perspective. Fresenius International Conference Evaluation and Registration of Plant Protection Products in Germany, Austria, Central and Eastern Europe, Cologne, Germany, 2003.

Harris CA. Advanced modeling of consumer exposure to pesticide residues—Recent developments and modeling in the future. 1st International Fresenius Conference on Food Safety and Dietary Risk Assessment, Mainz, Germany, 2002.

Harris CA. Modeling dietary exposure to pesticides residues. IBC AgChem Forum, Amsterdam, The Netherlands, 2002.

Harris CA. Development at the international level with respect to diets and consumer risk assessment. IBC AgChem Forum, Amsterdam, The Netherlands, 2002.

Harris CA. Past and future developments in assessing the risk of pesticide residues to consumers. Workshop on Food Contact Materials, International Life Sciences Institute, Milan, Italy, 2001.

Harris CA. Assessing the risk of pesticide residues to consumers. Annual Meeting of Pesticides Action Network Europe, Bremen, Germany, 2001.

Harris CA. Pesticide residues in lettuce. Lettuce Technology Group, Stockbridge Technology Centre, Cawood, UK, 2001.

Harris CA. Pesticide residues, MRLs and risk assessment. Pesticide Residues Committee Consumer Day, London, UK, 2000.

Harris CA. Pesticide residue variability and its associated impact on risk assessment. The European Pesticide Residues Workshop, York, UK, 2000.

Harris CA. The variability of pesticide residues in fruit and vegetables and the associated assessment of risk. University of Leeds Food Modeling Club, York, UK, 2000.

Harris CA, Renfrew MJ. Risk communication and pesticide residues can be a hazardous business! Proceedings, 1st Joint CSL/JIFSAN Symposium on Food Safety and Nutrition, York, UK, 2000.

Harris CA. Dietary risk assessment for pesticide residues—A national perspective. Proceedings, IUPAC-TACTRI/COA International Workshop on Pesticides, Taichung, Taiwan, pp. 148–153, 2000.

Harris CA. Are there ways to improve the assessment of risk from organochlorine pesticide residues in breastmilk? Proceedings, Central and Eastern European Section of SECOTOX. Publishing Centre of Slovak University of Technology, ISBN 80-227-1388-0, pp. 57–60, Bratislava, Slovakia, 2000.

Harris CA. Further developments of the Geneva consultation at the UK international conference on pesticide residue variability and dietary risk assessment. Workshop hosted by the Dutch Ministry of Health, The Hague, The Netherlands, 2000.

Harris CA. The EU/OECD workshop on minimum data requirements for establishing Maximum residue levels (MRLs) including import tolerances. Presentation to the OECD Working Group on Pesticides, Paris, France, 2000.

Harris CA. After the OP residues problems. Proceedings of the UK Carrot and Onion Conference, Cambridge, UK, 1999.

Harris CA. Herbicide and pesticide residues in food. Leatherhead Food Research Association, Leatherhead, UK, 1999.

Harris CA. Pesticides: Current regulatory controls and monitoring. Conference on Organic Foods and Children, Royal Society of Medicine, London, UK. 1999.

Harris C. How the variability issue was uncovered: The history of the UK residue variability findings. International Symposium on Pesticide Residues Variability and Acute Dietary Risk Assessment, York, UK, 1998.

Harris CA. Food safety and pesticide residues: Is there a problem? A regulator's perspective. Proceedings, British Crop Protection Council Conference on Pests and Diseases, Brighton, UK, 1998.

Harris CA. The variation of pesticide residues in fruit and vegetables and the associated assessment of risk. International Life Sciences Institute Workshop on the Acceptable Daily Intake (ADI), Milan, Italy, 1998.

Harris CA, Crossley SJ, Hamey PY. Methods for the estimation of dietary intake of pesticide residues: A review of recent developments. Proceedings, Brighton Crop Protection Conference on Crop Protection and Food Safety, pp. 75–82, UK, 1997.

Crossley SJ, Harris CA. UK technical policy on the consumer risk assessment of pesticide residues. Proceedings, British Crop Protection Council Conference on Pests and Diseases, Brighton, UK, 1996.

Harris CA, Crossley SJ. The calculation of human exposure to pesticide residues. SCI Lecture Paper Series No. 0082, London, UK, 1996.

Harris CA. The UK's programme for monitoring pesticide residues. Proceedings, ADAS Leafy Salads Conference, Newark, UK, April 1995.

Prior Experience

Manager of Human Health group/Head of Pesticides Chemistry, Pesticides Safety Directorate, UK, 1993–2001

Higher/Senior Scientific Officer, Pesticides Chemistry, Pesticides Safety Directorate, UK, 1990–1993

Scientific/Higher Scientific Officer, Technical Secretariat, Pesticides Safety Directorate, UK, 1986–1990

Assistant Scientific Officer, MAFF Regional laboratory, Bristol, UK, 1980–1986

Project Experience

Modeling of consumer exposure to pesticide residues using deterministic and probabilistic techniques. Significantly involved in the development of acute intake models and unit to unit variability of pesticide residues.

Written regulatory evaluations (monographs, evaluation documents, DARs) of physico-chemical properties, 'further information', analytical methodology, metabolism, residues and consumer risk assessment data in support of numerous new and existing active ingredients under the UK's Control of Pesticide Regulations (COPR) and EU Directive 91/414/EEC.

Temporary adviser to FAO/WHO Joint Meeting on Pesticide Residues and member of various FAO/WHO expert groups on dietary exposure.

Design of national and European pesticide monitoring studies and interpretation of findings.

Study monitoring – metabolism, pesticides residues, processing, storage stability, methods of analysis and physical and chemical properties.

Scientific co-ordinator and chair of the joint EU/OECD initiative on minimum data requirements for Maximum Residue Levels and import tolerances.

In-depth understanding of the occurrence of organochlorine pesticide residues and other persistent organic pollutants in breastmilk and risk assessment for breastfed infants. Advisor to the WHO/UNEP Global Survey of PoPs in Human Milk.

Personal expert to the EU's Scientific Committee on Pesticides (residues and intake sub-group).

Chairing national and international working groups and conferences.

National registration procedures for pesticides in the European Union.

Notification/dossier preparation for biocides under the European Union's Biocides Directive 98/8.

Structured and systematic literature surveys.

Taught courses on risk assessment methodology (including developing countries), presentation skills and negotiation techniques.

Professional Affiliations

- Fellow of the Royal Society of Chemistry, 1998
- Member, The Royal Society of Chemistry (Chartered Chemist), 1994