

**FAO/WHO Consultation on the Health Implications of Acrylamide in Food
WHO, Geneva, 25-27 June 2002**

List of major documents used by the consultation

To assist the WHO Consultation, WHO called on organizations and individuals that had information relevant to acrylamide in food to submit it to WHO for consideration by the Consultation. Information sought included, but was not limited to, the following:

- Toxicological data, in particular data on the potential carcinogenicity and neurotoxicology of acrylamide;
- Information relevant to elucidating the mode/s and mechanism/s of toxicity of acrylamide;
- Epidemiological data, including occupational studies;
- Information relevant to dietary exposure, including levels in food, as well as exposures through cosmetics and drinking water;
- Methods of analysis, particularly in food;
- Information on the formation and fate of acrylamide in food during cooking (all types) and other types of processing;
- Information on the binding of acrylamide and acrylamide precursors to food matrices, and their bioavailability; and
- Information relevant to risk management.

The attached tables include a list of the documents received, along with other major documents used. In addition to these, a reference collection of toxicology papers was available to the Consultation.

Table 1 WHO call for data on acrylamide: Submissions received (up to 24.6.02)

No.	Date of submission	Sent by	Title of paper/information item	Comments
1	17.05	Joint Research Centre European Commission (Sazan Pakalin)	European Union risk assessment report (final draft)	Paper available as a final draft, for WHO consultation.
2	29.05	Tapan Chakrabarti National Environmental Engineering Research Institute India	Data on Acrylamide	Unreferenced unpublished review by data provider.
3	29.05	Peter Ungeheuer Acrylamide Monomer Producers Association Germany	<p>1. Crump, K. S., 1999. Consideration of the Potency Classification of Acrylamide Based on the Incidence of Tunica Vaginalis Mesotheliomas (TVMs) in Male Fischer 344 Rats. The K.S. Crump Group, 602 East Georgia, Ruston, LA 71270.</p> <p>2. Crump, K. S., 1999. Mechanism of Acrylamide Induction of Benign Mammary Fibroadenomas in the Aging Female Fischer 344 Rat: Relevance to Human Health Risk Assessment. The K.S. Crump Group, 602 East Georgia, Ruston, LA 71270</p> <p>3. Crump, K. S., 2000. The Biological Role of Acrylamide-Induced Astrocytomas in the Aging Fischer 344 Rat to Human Health Outcomes The K.S. Crump Group, 602 East Georgia, Ruston, LA 71270.</p> <p>4. Crump, K. S., 2000. The Biological Role of Acrylamide-Induced Thyroid Follicular Cell Tumors in the Aging F344 Rat</p>	All documents cleared by data provider for use by the Consultation.

			<p>to Human Health Outcomes. The K.S. Crump Group, 602 East Georgia, Ruston, LA 71270.</p> <p>5. Crump, K. S., 2001. Hazard Analysis and Dose Response Identification for acrylamide. The K.S. Crump Group, 602 East Georgia, Ruston, LA 71270.</p> <p>6. Crump, K. S., 2001. Estimates of Acrylamide Intake from the Use of Personal Care Products Containing Polyacrylamide: A Monte Carlo Analysis. The K.S. Crump Group, 602 East Georgia, Ruston, LA 71270.</p> <p>7. Tyl, R. W., Marr, M. C., Myers, C. B., Ross, W. P. and Friedman, M. A., 2000. Relationship between acrylamide reproductive and neurotoxicity in male rats. <i>Reprod Toxicol</i>: 14(2), 147-157.</p> <p>8. Tyl, R. W., Friedman, M. A., Losco, P. E., Fisher, L. C., Johnson, K. A., Strother, D. E. and Wolf, C. H., 2000. Rat two-generation reproduction and dominant lethal study of acrylamide in drinking water. <i>Reprod Toxicol</i>: 14(5), 385-401.</p> <p>9. Friedman, M. A., Tyl, R. W., Marr, M. C., Myers, C. B., Gerling, F. S., and Ross, W., 1999. Effects of lactational administration of acrylamide on rat dams and offspring: <i>Reprod Toxicol</i> 13(6), 511-520.</p> <p>10. Tyl, R. W., and Friedman, M. A., submitted. Review: Effects of Acrylamide on Rodent Reproductive Performance. <i>Reprod Toxicol</i>.</p> <p>11. Sickles, D.W., Stone, J.D., and Friedman, M.A., 2002. Fast Axonal Transport: A Site of Acrylamide Neurotoxicity?,</p>	
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			<p>J.E., 2002. Acrylamide-induced cellular transformation. <i>Toxicol Sci</i>: 65(2), 177-183.</p> <p>18. Fennell, T.R., Snyder, R.W., Krol, W.K., and Susan C.J. Sumner S.C.J., (in preparation), Comparison of the Hemoglobin Adducts Formed by Administration of N-Methylolacrylamide and Acrylamide to Rats. <i>Tox. Sci</i>.</p>	
4	30.05	Tore Sanner The Norwegian Radium Hospital, Oslo, Norway	Opinion of the scientific Committee on Cosmetic Products and non-food products intended for consumers concerning acrylamide residues in cosmetics	Full opinion, cleared for use in WHO consultation.
5	31.05	Anders Tromborg, Matforsk Norway	Suggested plan for further work connected to acrylamide in Norway	.
6	31.05	European Commission Secretariat Scientific Committee on Food (Taina Sateri)	<p>Acrylamide (CAS No. 79-06-1) as a food contact material in the relevant legislation of the European Union (31 May 2002)</p> <p>Determination of Acrylamide in food simulants</p> <p>Opinion of the scientific committee on cosmetic products and non-food products intended for consumers concerning Acrylamide residues in cosmetics (1999)</p> <p>Opinion of the CSTE on the EU Risk Assessment Report on Acrylamide (2001)</p>	<p>Cleared for use in WHO consultation.</p> <p>http://europa.eu.int/comm/food/fs/sc/sccp/out95_en.html</p> <p>http://europa.eu.int/comm/food/fs/sc/sct/out88_en.html</p>
7	14 .05	Lars Hagmar University Hospital Lund, Sweden	Hagmar L, Törnqvist M, Nordander C, Rosén I, Bruze M, Kautiainen A, Magnusson A-L, Malmberg B, Aprea P, Axmon A. Health effects of occupational exposure to acrylamide using Hb adducts as biomarkers of internal dose. <i>Scand J Work Environ Health</i> 2001;27:219-226.	.

	16.05	Lars Hagmar (continued)	Application for research grant: The impact of food habits on haemoglobin adducts of acrylamide.	
8	31.05	Erland Brathen Marforsk, Norway	Comment on formation of acrylamide in food.	
9	3.06	Margareta Törnqvist, Department of Environmental Chemistry Wallenberg Laboratory Stockholm University Stockholm Sweden	Summary of studies on acrylamide at Dept. of Environmental Chemistry at Stockholm University	
10	5.06	Warholm et al Sweden	Improved risk assessment of acrylamide and similar compounds by studies on genetic susceptibility, Report to the Swedish Council for Working Life and Social Research, Stockholm, April 25 2002.	
11	7.06	Wendy Matthews UK Food Standards Agency	Acrylamide in Food – June 2002	UK data on acrylamide levels in food.
12	7.06	Rob M.C. Theelen Ministry of Agriculture, Nature Management and Fisheries The Netherlands	First results of a study of the formation of acrylamide in foods by the RIKILT Institute, Wageningen, The Netherlands	Submitted in Dutch.
13	10.06	Peter Spencer, OHSU/CROET	Miller S. Matthew and Spencer S. Peter. The Mechanisms of acrylamide axonopathy. Ann. Rev. Pharmacol. Toxicol. 1985. 25.643-66 Schaumburg H. H, Arezzo J.C. and Spencer P.S. Delayed onset of distal axonal neuropathy in primates after prolonged low-level administration of a neurotoxin. Annals of neurology, Vol 26, No. 4, October 1989.	

			Sabri I. Mohammad & al. Effect of exogenous pyruvate on acrylamide neuropathy in rats. Brain Research, 483 (1989) 1-11, Elsevier.	
14	12.06	NICNAS, Australia	National Industrial Chemicals Notification and Assessment Scheme Priority Existing Chemical Report on Acrylamide 2002 (Australian Risk Assessment Report)	
15	7.06	Norwegian Food Control Authority (M Widme)	Results of acrylamide in thirty Norwegian food samples. Risk Assessment of acrylamide intake from foods with special emphasis on cancer risk. Report from the Scientific Committee of the Norwegian Food Control Authority, 6 June 2002.	
16	14.06	Australian and New Zealand Food Authority (Tracey Hambridge)	Acrylamide Dietary Exposure Assessment Report	Australian dietary exposure assessment based on Swedish and UK data.
17	18.06	Bingheng Chen	Translated abstracts of a number of articles published in the Chinese scientific literature.	

Table 2 Other Information Collected

Item	Title of paper/information item	Comments
1	Material from Swedish National Food Administration (NFA) website: <ul style="list-style-type: none"> • Press Release by NFA • Acrylamide in foodstuffs, consumption and intake • Individuals results for all tested samples • Analytical methodology and survey results for acrylamide in foods • Acrylamide – Cancer studies and comparisons of risk • Recommendations regarding acrylamide in Food • Toxicological aspects of acrylamide 	Source: NFA website http://www.slv.se/HeadMenu/livsmedelsverket.asp
2	Press Release UK Food Standards Agency – Levels of acrylamide in food.	Source: internet

		http://www.foodstandards.gov.uk/news/newsarchive/60581
3	Press Release of Swiss data on levels of acrylamide in food.	Source: internet, select item 13/6 from below site. http://www.bag.admin.ch/verbrau/aktuell/d/index.htm In German and French, (English translation of table of data provided). .
4	Tareke, E et al (2000) Acrylamide: A cooking carcinogen? <i>Chem Res Toxicol</i> 13, 517-522	.
5	Tornqvist M and Ehrenberg L (2001) Estimation of cancer risk caused by environmental chemicals based on in vivo dose measurement. <i>J Env Pathol, Toxicol, Oncol</i> , 20(4), 263-271	
6	US Report on Carcinogens Evaluation of Acrylamide	Source: internet http://ntp-server.niehs.nih.gov/htdocs/8_RoC/RAC/Acrylamide.html
7	IPCS INCHEM Pesticide Information Monograph on Acrylamide, 1999	Source: internet http://www.inchem.org/documents/pims/chemical/pim652.htm
8	IARC evaluation of Acrylamide: Summary of data reported and evaluation	Source: internet http://monographs.iarc.fr go to 'search IARC agents and summary evaluations'
9	Data on acrylamide levels in food from two Swiss retailers (independently submitted)	
10	Comment on analytical issues from Japan (National Institute of Health Sciences)	
11	Results on acrylamide contents in various foods (Official Food Control Authority of the Canton of Zurich, Switzerland)	

12	Acrylamide in US Foods (Center for Science in the Public Interest, US)	
13	Selected excerpts from <i>Health risk assessment of acrylamide (IMM report February 1998)</i> , Institute of Environmental Medicine, Karolinska Institut	Translation provided.