Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment

Minutes of the meeting held on Tuesday, 14 May 2013 in Aviation House, London.

Present

Chairman:	Professor D Coggon		
Members:	Mr D Bodey		
	Dr R Crevel		
	Dr A Hansell		
	Dr C Harris		
	Prof D Harrison		
	Prof R Harrison		
	Prof B Houston		
	Prof B Lake		
	Prof I Morris		
	Dr N Plant		
	Prof R Smith		
	Dr J Thompson		
	Prof FM Williams		
Food Standards Agency (FSA) Secretariat:	Dr D Benford	Scientific Secretary	
	Ms R Acheampong		
	Dr C Baskaran		
	Dr E Cemeli		
	Dr M Kurzawa-Zegota		
	Mr B Maycock		
	Ms C Mulholland		
	Dr D Parker		
	Ms C Potter		
	Mr A Sbaiti		
Public Health England (PHE) Secretariat:	Ms F Pollitt	Scientific Secretary	
	Dr L Hetherington		
Co-Opted Members	Prof P Aggett	Vice-Chairman, SACN	
	Dr C Venter	University of Portsmouth	Item 5
	Prof G Devereux	University of Aberdeen	Item 5
Contractors	Dr S Bull	Ricardo-AEA	Item 4
	Dr C Pease	ENVIRON	Item 4
	R Boyle	Imperial College London	Item 5
	V Garcia	Imperial College London	Item 5
Officials	Dr M Carrington	Department for Environment, Food and	Item 4

		Rural Affairs (Defra)	
	Mr D Middleton	Defra	Item 4
	Ms B Gadeberg	PHE, Centre for Radiation, Chemical and Environmental Hazards (CRCE)	Item 4
	Ms K Foxall	PHE, CRCE	Item 4
	Ms L Uffindell	PHE, Environment and Health	Item 4
	Dr A Dowding	FSA, Contaminants Branch	Item 4
	Dr S Hardy	FSA, Additives	Item 5
	Ms S Hattersley	FSA, Additives	Item 5
	Ms N Shapiro	FSA, Additives	Item 5
	Ms R White	PHE, Nutrition	Item 5
Assessors	Dr T Gant	PHE	
	Dr M Benton	Health and Safety Executive (HSE)	
	Dr C Powseland	Environment Agency	
Observers	Ms C McCaffrey	Land Quality Management Ltd	Item 4

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Announcements

1. The Chairman, Professor Coggon, welcomed Members and assessors to the meeting. He also welcomed: Drs C Pease and S Bull, invited speakers from ENVIRON and Ricardo-AEA respectively, present for Item 4; Drs R Boyle and V Garcia, invited speakers from Imperial College London, present for Item 5; Professor P Aggett, a member of SACN and its subgroup on Maternal and Child Nutrition present as a Co-opted Member for Item 5 and other items related to infant feeding; Dr C Venter from the University of Portsmouth and Professor G Devereux from the University of Aberdeen present as Co-opted Members for Item 5; and officials from Defra - Dr M Carrington and Mr D Middleton (both present for Item 4), and Public Health England – Ms B Gadeberg, Ms K Foxall, Ms L Uffindell (all present for Item 4) and Ms R White (present for item 5).

2. Members were informed that, as of 1st April, the Health Protection Agency (HPA) and the majority of the nutrition workforce of the Department of Health, had transferred to Public Health England (PHE). The secretariat to the COT was now provided jointly by FSA and PHE.

3. The Chairman reminded those attending the meeting to declare any commercial or other interests that they might have in any of the agenda items.

Item 1: Apologies for absence

4. Apologies were received from Dr R Brimblecombe, Prof J Cade, and Dr M Graham.

Item 2: Draft minutes of the meeting held on Tuesday, 26th March 2013 – TOX/MIN/2013/02

5. The minutes of the 26th March 2013 meeting were agreed subject to minor editorial amendments in the reserved section, item 5.

Item 3: Matters arising

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6. Para 10: *Report of the COT subgroup on the Lowermoor water pollution incident.* Members were informed that there had been limited media interest since publication of the report. Reaction had been predominantly from local residents. Cornwall MPs had not been happy with the report because they had wanted an investigation into how incident had been handled.

7. Para 13: Dr Piersma had agreed to attend a COT meeting later in the year to give a presentation on susceptibility of juveniles.

8. Para 17: Papers on HCH had been forwarded to relevant Members.

9. Para 18: Guidance on assistance needed with the organophosphate review had been forwarded to COT toxicologists

Item 4: SACN review of vitamin D

10. Para 32: Provisional views of the COT would be presented to the SACN working group meeting on 15 May. A further paper on vitamin D was expected to be on the COT agenda on 2 July.

Item 5: Aspartame research

11. Para 34: Further information on the FSA funded research on aspartame was expected to be on the COT agenda on 2 July.

Item 6: First draft statement on the potential risks from high levels of soy phytoestrogens and soy products in the infant diet

12. Para 46: Papers had been forwarded to members and a second draft statement was expected to be on the COT agenda on 2 July

Item 7: Second draft statement on the potential risks from high levels of aluminium in the infant diet

13. Para 54: A third draft statement was item 8 on the current agenda.

Item 8: Third draft statement on the potential risks from high levels of lead in the infant diet

14. Para 58: A fourth draft statement was expected to be on the COT agenda on 2 July.

Item 9: Reports of hypervitaminosis A in infants (0-2 years old) through oral exposure at levels ≤ 1,000 µg RE/kg retinol

15. Para 62: A third draft statement was item 6 on the current agenda.

Item 10: Brief overview of the toxicology and occurrence data available for endosulfan and its isomers, pentachlorobenzene and chlordecone

16. Para 67: A draft statement was item 7 on the current agenda.

Item 4: The development of new screening levels for contaminants in soil – TOX/2013/18

17. No interests were declared

18. The Committee's view was sought on a revised toxicological framework to aid the development of new screening levels for contaminated land risk assessment, following revisions to the relevant Statutory Guidance in 2012.

19. Members were provided with TOX/2013/18 and its annexes, detailing the revised Statutory Guidance designed to provide clarity to the contaminated land sector (and Local Authorities in particular) on how to interpret and implement Part 2A of the 1990 Environmental Protection Act. The Part 2A legislation took a risk-based approach to defining contaminated land. Under the legislation, for cases of risks to human health, land should only be classified as contaminated in the legal sense if significant harm was occurring, or there was a "Significant Possibility Of Significant Harm" (SPOSH) being caused.

20. The revised Statutory Guidance introduced a new approach to determination of whether land should be designated as contaminated in the legal sense, using a classification with four categories. Under this system, land in Categories 1 and 2 would be determined as contaminated under Part 2A, whereas that in Categories 3 and 4 would not. Category 4 represented land of lowest concern, whilst Category 3 comprised sites that regulators concluded should not be designated as contaminated under Part 2A, but only after a detailed quantitative risk assessment.

21. Annex B referred to Category 4 Screening Levels, which were threshold levels of soil contamination by specified pollutants, below which the relevant pollutants could be ruled out as a reason for designation of land as contaminated without a need for more detailed risk assessment. Defra had commissioned a research project to develop a methodology by which these new Category 4 Screening Levels could be established, and to test it by deriving Category 4 Screening Levels for six contaminants (lead, chromium VI, arsenic, benzene, cadmium and benzo[a]pyrene).

22. Drs Morwenna Carrington (Department for Environment, Food and Rural Affairs (Defra)) and Camilla Pease (ENVIRON) gave a presentation which provided background to and described the development of these new Screening Levels. Dr Sarah Bull (Ricardo-AEA) was also present to answer questions.

23. Defra had initially selected the six contaminants on the basis that they covered the majority of exposure pathways and would therefore be an adequate test of the methodology, and the choice had been supported by stakeholders when consulted. The report of the project would be peer-reviewed. However, there was currently no plan for Defra to fund derivation of Screening Levels for further contaminants. The contactors highlighted that the aim of the project was to develop a framework which would be described in the final report, and which would then need professional expertise to implement.

24. One Committee Member, who was familiar with contaminated land policy, commented that the broad approach was reasonable. Other Members noted that although Screening Levels were based on toxicological data, what was deemed acceptable would depend on subjective value judgements about uncertainties. There was concern that if a screening level was not determined centrally, different values would be derived by different organisations, and also that there could be

inconsistency in the approach to different chemicals. The framework and derived values would need to be robust in case of legal challenge.

25. The Committee asked whether mixtures of chemicals had been considered. Mixtures had not been addressed specifically. However, combined effects of pollutants could be taken into account, if relevant data were available.

26. It was pointed out that while for some contaminants (for example cadmium) there were a lot of data, this would not always apply. Members asked what procedures would be followed in this circumstance.

27. The Contractors agreed that while the six chemicals evaluated in the project were data-rich, fewer data were available for many other chemicals. Approximately thirty to forty chemicals had soil guideline values (SGVs) and/or generic assessment criteria (GACs). In the case of these chemicals, previous methods of evaluation would continue to be used unless new toxicology or exposure data were available and needed to be taken into account, or new risk management decisions were taken centrally, applying the new framework to derive Category 4 Screening Levels.

28. While in general, Members agreed that the report was good, some concern was expressed about the specification of thresholds that were above minimal risk. Currently, toxicological evaluation was used to derive minimal effect levels, known as Health Criteria Values (HCVs), and then a judgement was made by Local Authorities to apply less stringent criteria when deciding whether the levels of contaminant at a site were acceptable. However, it appeared that minimal effect levels were not the starting point in the new approach, and it was felt that this should be the case. In response, it was explained that within the new framework minimal risk levels would still be defined.

29. The definition of “contaminated land” was set out in legislation and would not be changing. However, the screening levels that were introduced in the new Statutory Guidance, would change how assessments were carried out, in a way that was intended to reduce the number of time-consuming detailed *ad hoc* assessments and make decisions more consistent. Hence, both exposure and toxicological assessments were modified from minimal risk. Under the current system based only on SGVs, it was not clear what should be done in cases where SGVs were slightly exceeded. The new screening levels aimed to provide a better scientific basis for decision-making.

30. Sufficient dose-response information had been available to quantify risk at specific levels of exposure for the six contaminants examined, and the Contractors’ use of probability density functions in the risk analysis had been a refinement.

31. It was made clear that the starting point of the framework was understanding what levels of contamination posed minimal risk, and that there was no intention to update the HCV and SGV values going forward.

32. The Committee stated that they would like to see the minimal risk HCVs updated and made publicly available. There was also a question as to whether the new framework would be more resource intensive, and whether more expertise

would be required to perform individual assessments. It was pointed out that setting a Category 4 Screening Level for a new contaminant need only be done once, and could be carried out centrally, but that the process of evaluating quantitative dose-response relationships in key toxicology data would require toxicology expertise. The aim of the framework was to define a level of contamination below which there would be adequate reassurance that risks were acceptable. However, this needed to be more transparent in the wording of the framework to ensure that it would also be clear to a lay reader.

33. Some members were concerned that there were references to policy-based decisions, and emphasised that the new screening levels should be set purely on a scientific basis. In response, the contractors explained that the aim of the framework was to enable more scientifically informed policy decisions. In setting screening levels above minimal risk, the definition of 'low risk' and choice of safety margins entailed risk management as well as risk assessment. It was envisaged that scientists and policy-makers would need to work together in a transparent way when making these risk management decisions.

34. Within the framework there was strong emphasis on updated exposure data, which prompted the question as to whether enough exposure data were available. For example, in the case of cadmium, absorption from dermal exposure was assumed to be similar to that from oral exposure. Members were informed that a few data had been available with which to update the exposure model, and where this was possible it had been done. There were some data on exposures by inhalation and orally, but few on dermal exposures.

35. Members commented that views on what constituted an acceptable low level of toxicological concern (LLTC) were likely to change over time. The Committee asked whether water and boreholes had been included in the framework, and were advised that they were not included, but were dealt with separately.

36. In relation to figure 3 of TOX/2013/18, Members asked whether only epidemiological data had been used, or whether findings from other human studies had also been used. The Committee were informed that there had been a focus on human population-based controlled exposure studies from occupational settings within authoritative guidance reviews, but that other literature on smaller scale human 'toxicology' studies could be considered if available.

37. With respect to setting LLTCs, the Committee asked which data had been used when overlapping dose response curves existed. The contractors referred to lead as an example in which benchmark dose (BMD) values had been calculated for three endpoints (neurodevelopmental effects on children, blood pressure and renal effects in adults) with overlapping dose-response curves. Within this framework the most sensitive endpoint was used and cross-checked against risks of other endpoints. Members commented that if benchmark dose lower confidence limits (BMDLs) were being used, then selection of the most sensitive endpoint might be influenced by the size of the relevant datasets.

38. It was suggested that if there were only 6 to 10 important contaminants then reports of original research should be evaluated, and not just authoritative reviews by

bodies such as the World Health Organization (WHO) and the European Food Safety Authority (EFSA) etc. It was confirmed that where possible, the Contractors had gone back to the original study reports cited within reviews.

39. The Committee also made the point that consideration should be given to clarifying the guidelines on sampling soil, and that localised hot spots of higher contamination should be taken into account.

40. The Committee were informed that Defra planned to organise peer-review of the framework which had been developed for the six contaminants. It was suggested that to ensure transparency, expert panels should be used for the peer-review rather than individual advisors.

41. The Committee provided responses to five questions which had been asked of them in TOX/2012/18.

42. (i) The Committee felt that the "low level" in the new term, "Low Level of Toxicological Concern" (LLTC), that was proposed as part of the revised toxicological framework might be overlooked by the public, who would focus more on the "toxicological concern". Members recommended that sociological research on how the public would perceive the term would be useful.

43. (ii) Members commented that the approach adopted in the project was consistent with that applied in many other areas of toxicological risk assessment for chemicals. However, there was some concern about the proposed method for developing LLTCs, as regards setting and maintaining the margin between SGVs and Category 4 Screening Levels. It was also recommended that some of the current minimal risk HCVs should be revised to take account of newer data.

44. (iii) The committee agreed that the use of a chemical-specific margin (CSM) approach, which paralleled the margin of exposure (MOE) approach, was appropriate to derive an LLTC for non-threshold chemicals. However, defining an acceptable margin entailed value judgements, and was not purely scientific. It involved an element of risk management, and careful consideration should be given as to how risk assessment and risk management could be brought together without the possibility of misuse. Specific criteria were needed by which to define the levels of margins, supporting the need for a central discussion rather than *ad hoc* local decisions.

45. (iv) In the context of cancer and the use of an Excess Lifetime Cancer Risk (ELCR) higher than 1 in 100,000 to define a LLTC, the Committee commented that a level of exposure associated with a 1 in 100,000 excess risk could not be established scientifically, and therefore it was necessary to consider margins on exposures that caused larger effects. The Committee recommended that further advice on this should be sought from the Committee on Carcinogenicity (COC). ELCRs were used by other bodies internationally and so could not be ignored. However, it is a risk management decision to define an acceptable level of risk. Members agreed that it was important that transparency be maintained in making such decisions.

46. (v) The Committee advised that in finalising this research project, differences in the absorption of contaminants from different routes of exposure should be accounted for in the toxicological assessment rather than the exposure assessment.

47. The Contractors were thanked for their presentation and discussion.

Item 5: Update on the review of infant feeding and allergy. (RESERVED BUSINESS) – TOX/2013/19

48. No interests were declared.

49. The Chairman reminded members and experts that discussion of this item was being held under reserved business whilst the protocols were being reviewed and submitted for peer review.

Item 6: Third draft statement on the potential risks from high levels of vitamin A in infant diet – TOX/2013/20

72. No interests were declared.

73. During initial discussions on complementary and young child feeding at the COT meeting in February 2012, Members had concluded that there was a need for further evaluation of vitamin A. Following on from the discussion at previous meetings, a third draft statement had been prepared. This included the rationale for the derivation of a tolerable upper level, and exposures estimated with new available consumption data from the *Diet and Nutrition Survey of Infants and Young Children* (*DNSIYC*) for infants consuming complementary foods.

74. Members requested minor editorial amendments throughout the paper and further clarification of the terminology for vitamin A and related compounds, as well as on certain biological points.

75. A fourth draft statement would be presented at a future meeting.

Item 7: First draft statement on endosulfan isomers, pentachlorobenzene and chlordecone in relation to infant diet – TOX/2013/21

76. No interests were declared.

77. An initial evaluation of persistent organic pollutants (POPs) that had been discussed in February 2013, demonstrated lack of occurrence data for α-, β- and γ-hexachlorocyclohexane in the infant diet in the UK. The Secretariat had therefore investigated what data were available on the occurrence of the other POPs selected for evaluation (endosulfan and its isomers, pentachlorobenzene and chlordecone). This information, together with a summary of the background and main toxicological properties for each chemical had been included in a brief overview presented to the Committee in March 2013. The current paper provided a first draft statement,

including further details on more recent toxicity studies and data on residues in breast milk.

78. Members requested that the sections of the statement for each chemical have separate conclusions. Further detail was needed on the reports reviewed, particularly with respect to the proportions of endosulfan isomers in the material tested in various studies. Additional editorial changes were also requested.

79. These points would be addressed in a further draft of the statement for discussion at a future meeting.

Item 8: Third draft statement on the potential risks from high levels of aluminium in the infant diet – TOX/2013/22

80. Dr Crevel declared a personal specific interest as his employer produced personal care and possibly food products that incorporated aluminium-containing food additives. He took no part in the discussion.

81. During initial discussions on complementary and young child feeding at the COT meeting in February 2012, Members had concluded that there was a need for more detailed consideration of aluminium. Following on from previous discussions members were now provided with a third draft statement. Key changes from the second draft were incorporation of levels of aluminium in soil, use of the highest reported level of aluminium in water in exposure estimates, and conclusions which reflected the fact that renal excretion is still developing in infants.

82. Members requested minor editorial changes and the statement would be finalised by Chair's action. A lay summary would be drafted and circulated for comment.

Item 9: GACS Working Group on data exploitation – TOX/2013/23

83. The FSA General Advisory Committee on Science (GACS) had been asked to assist the FSA in exploring whether and how it might better exploit data by new methods of monitoring and data-mining. GACS membership includes the Chairs of each of the FSA's advisory committees and the COT Chair presented a draft GACS paper to the Committee. The draft paper was a background/scoping document that was not in the public domain. Members were invited to comment on the paper, including on sources of data and methodology.

84. An example of where data mining had been useful in the context of public health was provided by a Member in relation to an outbreak of *Salmonella* food poisoning. The example was described and the Member would provide further details to the Chair to feed back to GACS. North American poisons centres were publishing real time information on reports of medical symptoms across their country using approximately 40 main descriptors. That open publication had enabled a data-mining approach, and after symptoms of food poisoning emerged, clusters of reports were traced to contaminated lettuce.

Papers for information

Item 10: Diet and Nutrition Survey of Infants and Young Children (DNSIYC) – TOX/2013/24

85. Members were provided with this paper for information and the Chairman noted that actual consumption reported in DNSIYC often differed from recommendations. This should be taken into account when the COT gave advice.

Item 11: Any other business

86. Members were reminded to fill in Members' feedback forms, Declaration of interests forms and Expenses claims forms

Use of potassium chloride as a sodium substitute in some foods

87. Members were reminded that, as part of DH's overall salt reduction strategy there had been some interest in the use of potassium chloride as a replacement for sodium in foods where it had not been possible to reduce sodium levels by other means. However, higher intakes of potassium might pose a risk to individuals with impaired renal function (many of whom are required to follow a low potassium diet). It had also been suggested that many individuals with impaired kidney function may not have been diagnosed and it was these individuals who would be of particular concern. However, the size of this vulnerable group was uncertain and there appeared to be little available information.

88. Members proposed an expert to advise on this topic, and also suggested that advice be sought from Kidney Research UK. It was anticipated that a paper on the topic would be brought to the July COT meeting.

Item 14: Date of next meeting

89. The next meeting was scheduled to take place on Tuesday 2nd July 2013 at Conference Rooms 4 & 5, Aviation House, 125 Kingsway, London WC2 6NH.