



Scientific Advisory Committee on Nutrition

## 9th MEETING

### Carbohydrates Working Group

18<sup>th</sup> November 2010, Room LG27, Wellington House  
135-155 Waterloo Road, London, SE1 8UG

## FINAL MINUTES

<b>Chair:</b>	Professor Ian Macdonald
<b>SACN Members:</b>	Professor Annie Anderson Professor Tim Key Dr David Mela Professor Ian Young Mrs Christine Gratus Professor Angus Walls Professor Ian Johnson
<b>Other attendees:</b>	Dr Victoria Burley (University of Leeds) (agenda item 3 only) Dr Darren Greenwood (Statistician, University of Leeds) (agenda item 3 only) Ms Diane Threapleton (University of Leeds) (agenda item 3 only) Ms Alison Eastwood (CRD York) (agenda item 3 only) Dr Peter Sanderson (agenda item 4 only)
<b>Observer:</b>	Dr Alison Tedstone

**Secretariat:**

Dr Elaine Stone

Mrs Vicki Pyne

Ms Emma Peacock

Mr Andrew James (Statistician) (agenda item 3 only)

**Agenda item 1 – Chair’s introduction and welcome**

1. The Chair welcomed members to the ninth meeting of the SACN Carbohydrates Working Group.
2. Apologies were received from Professor Julie Lovegrove, Dr Mark Beattie and Dr Sheela Reddy.
3. The Chair asked members whether there were any changes to their declaration of interest. The Chair reminded members that he would be stepping down from his position on the Advisory Board to Mars Europe, the European Scientific Advisory Committee to Coca Cola Europe, and the International Public Policy Advisory Board for the Coca Cola Company, Atlanta, as of 31<sup>st</sup> December 2010. The Chair informed members that he had been invited to be an observer on the Government’s Food Network group, however, due to the meetings being arranged at relatively short notice he had been unable to attend any of the meetings to date.

**Agenda item 2 – Minutes of the 8<sup>th</sup> meeting (SACN/Carbohydrates/10/mins/03)**

4. Members were invited to comment on the minutes of the 8<sup>th</sup> meeting of the Carbohydrates Working Group.
5. Paragraph 32 needs rewording, as it is unclear. It was agreed that the Secretariat would refer back at their notes from the previous meeting and rephrase with input from the Chair.
6. Paragraph 37, 1<sup>st</sup> sentence, should be amended to read ‘...the Park et al., 2005 pooled analysis utilised a large amount of data and was therefore more robust....’

7. A member requested that paragraph 42 should be removed because it was unclear.
8. Paragraph 44, should include 'associated with high fibre intake'.
9. The information in paragraph 45 should be separated out, as the sentences refer to different studies.
10. Paragraph 50; insert the word 'other' before European diets.
11. Subject to the above changes, the minutes were agreed as an accurate record of the meeting.

**Action: Secretariat**

**Matters arising (SACN/Carbohydrates/10/17)**

12. The Chair introduced the matters arising.

*Agenda item 3 – Carbohydrates and colorectal health*

13. Members were informed that the Secretariat had asked the Department of Health (DH) Nutrition Surveys Team about whether data on AOAC intakes are collected as part of the National Diet and Nutrition Survey (NDNS). Members noted that the NDNS only used the Englyst method to record fibre intakes.

*Agenda item 3 – Carbohydrates terminology, classification and definitions*

14. SACN's definition of fibre to be discussed under agenda item 5.

*Agenda item 7 – Carbohydrates and colorectal health*

15. The summary of the normal function section and the entire clinical section of the colorectal review to be discussed under agenda item 4.

*Agenda item 7 – Carbohydrates and cardiometabolic health*

16. To be discussed under agenda item 3.

17. A member enquired about the progress of the oral health review. The Secretariat confirmed that a business case had been drafted which will initially be considered by procurement at DH and, if successful, will ultimately need to be signed off by the Secretary of State for Health.
18. In case of any future delay in commissioning the oral health review, a member suggested the Carbohydrate and Health report could be published in two volumes so not to affect the progress of the colorectal health and cardio-metabolic health review. The Working Group's overall recommendations could then be published with the second volume of the report.
19. Members noted that the World Health Organization (WHO) is reviewing the evidence on sugars and dental caries, which is due for publication in the spring and could be used to inform SACN's review. Members were informed that the review has not included other carbohydrates or food sources of carbohydrates. In addition only sugar quantity has been considered and not frequency of sugar consumption.

**Action: Secretariat**

20. The Chair suggested it would be useful for the Working Group to discuss the structure of the carbohydrate and cardio-metabolic review before the Leeds team joined the meeting.
21. A member suggested a way of condensing the text needs to be considered and the forest plots should be integrated into the relevant sections similar to the colo-rectal health review.
22. It was agreed that the Working Group should give the Leeds team guidance on the structure of the review to make it easier to read.
23. A member raised the issue of how the Working Group envisage presenting the overall carbohydrates review. It was suggested that some of the information could be appended. A hard copy of the report could be published with detailed sections of the review

provided on a CD or published on the SACN website.

24. A member highlighted that there are now four NHANES cohorts, therefore it needs to specify which one is being referred to in the review.

25. Members agreed that the colo-rectal and cardio-metabolic health reports should have a consistent structure.

**Agenda item 3- Carbohydrate and Cardio-Metabolic Health (SACN Carbohydrates/10/18)**

26. The Chair welcomed Victoria Burley, Darren Greenwood and Diane Threapleton from the University of Leeds.

27. Victoria Burley introduced the draft chapter on prospective cohort studies and the incidence of cardiovascular disease.

28. Members were informed that a full draft including chapters on cardiovascular disease markers (e.g. lipids, markers of inflammations), diabetes and obesity would be presented at the next meeting.

29. The Chair invited members to comment on the paper.

30. It was recommended that section 1.4 non-fatal indices of CVD should be combined with section 2 markers of cardiovascular risk.

31. Members agreed that it would be useful to have an introduction to the chapter. A discussion on the study methods, such as dietary intake measures should be included in the introduction with commentary on the drawbacks of the study design. It was agreed that it would be important for the introduction to be drafted by the Leeds team before the Working Group started interpreting the results.

32. The contents page requires revising so that text is not repeated.

33. It was noted that the data are derived from a limited number of cohort studies and it was suggested that a table summarising these studies is included together with some written commentary describing the issues. This would reduce duplication of information in the report.
34. The duration of follow up for the trials included in the review was unclear. It was confirmed that the weight loss trials had at least a 12 month follow up period. For any weight loss trial with less than a 12 month follow up period, which reported on other outcomes, the study was included in the review as long as the follow up period was for at least 6 weeks.
35. Darren Greenwood informed members that the method of Hamling et al (2008) has been used to combine the data for coronary heart disease and stroke in order to obtain an overall estimate for cardiovascular disease.
36. A member highlighted that the search protocol needs to be more prominent in the report. It was agreed that the Secretariat would consider this further. It was noted that if the protocol is placed in the appendix it should still be referenced in the methods section.
- Action: Secretariat**
37. The word “main” should be omitted in the title of table C, as this implies that a study could only be categorised under one code.
38. Victoria Burley highlighted that a 10% sample of excluded studies were checked to see if any were misclassified in error.
39. A member queried that if 17 references from the 10% checked sample were identified as being potentially relevant, there could be more papers which have been excluded in error. Therefore, it would be useful to know if any of the 17 references were actually relevant.

**Action: Victoria Burley**

40. Victoria Burley introduced the example table on page 27 of the report, explaining that all abbreviations were in the appendix. Column 9 of the table, details the outcome level, which was specifically linked to each chapter.
41. The Chair asked the Working Group to comment on the table layout.
42. It is not stated whether the length of follow up is reported as mean or total duration, however the data has been extracted and so this information could be added.
43. A member highlighted that the origin of the EPIC Potsdam study should be checked because the table states it was conducted in the Netherlands, but it is a German cohort.
44. A member asked if the subgroup analyses were conducted by the study authors as part of the original research question. The Leeds team confirmed that this information may not be available for cohort studies and it would be difficult to go back and look through each study. The data has already been extracted for RCT's but this information could be potentially checked if meta-analyses were to be conducted on the subgroups.
45. In column 12 of the table will be amended because it should read 5% increment energy, rather than 5%/ energy.

**Action: Victoria Burley**

46. Victoria Burley confirmed that the Leeds team had followed a similar protocol to the World Cancer Research Fund (WCRF) report. Members noted that currently the table contained a lot of information. The table was presented as one table for this meeting, however it could be separated into two tables if required.
47. A table explaining why studies have been excluded from the review should be appended to the report so that SACN can support the methodology if required. The Leeds team confirmed that this could be provided.

**Action: Victoria Burley**

48. Members agreed that the tables should be similar to that of the colo-rectal health review, for example, the name of the cohort should be the same. It was agreed that the Secretariat would send the Leeds team the draft colorectal health review to use as a guide.

**Action: Secretariat**

49. The Chair suggested the Working Group discussed the meta-analysis section of the report first and then considered the summaries at the beginning of the report.

50. Members noted that there was a lot of heterogeneity between the cohort studies, which should be taken into account when interpreting the pooled analysis on page 21. The heterogeneity between the cohort studies could be due to the dietary assessment method used.

51. A member noted the cardiovascular events were not separated from mortality. It was explained that most studies focused on incidence of disease or cardiovascular events and very few have stratified for fatal events.

52. A member queried whether the two forms of stroke, ischaemic and haemorrhagic, had been distinguished in the studies. Members were informed that most studies had reported stroke as an overall outcome and had not separated by type. It was agreed that this should be noted in the text.

**Action: Victoria Burley**

53. Members noted that the random effects model had been used which may give greater weight to smaller studies. Darren Greenwood (DG) explained to the Working Group that the fixed effects model was used to combine estimates from men and women from the same study, this single estimate was then entered into the meta-analysis using the random effects model.

54. DG informed members that for a meta-analysis to be performed there had to be three or more cohort studies and heterogeneity must not exceed 75% ( $I^2$  statistic).

55. The Working Group agreed that they were happy with this approach and that a note of

caution should be added in the text where appropriate.

56. In general, where there was one or more published paper from the same cohort, the most recent paper was used as this had the longest follow up. Where a cohort was followed up over different stages, the follow up period with the largest number of cases was taken. No cohorts were included in the review that had a follow up period of less than three years.

57. It was agreed that Andrew James and Darren Greenwood should discuss the statistical approaches used in the colorectal health and cardiometabolic health reviews to ensure consistency.

**Action: Darren Greenwood and Andrew James**

58. In the fibre from vegetables forest plot (1.5.5), it was queried to what extent 10g/day of vegetable fibre intake reflected estimated intakes. It was confirmed that this level of intake was derived from the linear regression model. Members requested that the Leeds team check whether this was outside the range of intakes recorded in the studies. It was suggested the data should be presented as per 5g/day of vegetable fibre or a level which reflects true intakes.

59. It was noted that the funnel plots on p207 and 209 look different, yet the same studies have been included. The Leeds team agreed to check this.

60. A member asked whether potatoes were included as vegetables in the US. It was also unclear whether vegetables are defined in the same way in Europe as in the US. It was agreed that this should be checked.

**Action: Victoria Burley**

61. A member queried whether the studies investigating specific forms of fibre eg fruit fibre, have adjusted for total fibre. Table 1.2.1.h starting on page 99, contains information of the factors which have been adjusted for in these studies.

62. A member highlighted that in the section on fibre from fruit and vegetables it was unclear whether fibre was consumed from the intact fruit or vegetable or derived from fruit and vegetable products. It was agreed that the section titles should read 'fibre as consumed

from vegetables' and 'fibre consumed as fruit', to improve clarity on where the evidence base was from.

63. Details of what foods are in each of the food groups should be listed together with the uncertainties, including notes of caution where studies had not adjusted for certain confounders. This should be included as an introduction to each section.
64. The confidence intervals for Panagiotakos et al., 2009 (1.00, 1.00) need to be checked.
65. There was concern about placing too much emphasis on the associations observed in these studies because people who eat high fibre diets are likely to be engaging in other healthy activities. Therefore, it was agreed that cautionary text should be added to each section that residual confounding, heterogeneity and bias could have led to weaker or stronger associations being observed.
66. A member requested that text explaining why potatoes are treated separately from vegetables should be included in the report.
67. On page 217 exclude the sentence where it is states '...pooled estimate has little meaning...'

**Action: Victoria Burley**

68. Victoria Burley confirmed that section 1.5.12 was on legumes as a whole and not legume fibre, as detailed in the protocol. Members discussed the point of whether fruit and vegetables as a whole should also be included, as currently only fibre as consumed from fruit and vegetables was included, however this would substantially add to the review and the workload of the Leeds team. Members also noted that fruit juice had not been included. It was agreed that the Working Group needed to decide whether fruit and vegetables and fruit juice should be included in the review. If the Working Group decided not to include these food items, full justification would be required in the text (See paragraph 116).

69. Members discussed that in the colo-rectal health review minimally adjusted studies were not included in the meta-analyses and that this term may be useful to apply to this review, for example if studies had not adjusted for smoking, they should not be included. It was agreed that all studies included in the review should adjust for smoking, alcohol and age. A member raised the point that there were a number of other risk factors for cardiovascular disease more important than alcohol. By excluding studies that had not adjusted for alcohol intake a number of studies would be excluded. It is questionable to exclude studies which had failed to correct for alcohol consumption, while including studies that had failed to adjust for more important risk factors such as BMI.
70. It was agreed that the Leeds team will not exclude any studies at this stage, but will highlight if age and smoking have not been adjusted for in the studies.
71. Members noted that if studies were to be excluded, it was important to have a clinical and nutritional justification for doing so and this should be explained in the review.
72. Members agreed that the information on the units of intake in the meta-analysis should be consistent with the text e.g. p221 servings per week is stated in the text, but the forest plot states servings per day. In addition, it should be within the range of the data presented in the study and meaningful.
73. A member highlighted that the definition of glycaemic load on page 146 was incorrect and it should be amended to read 'glycaemic load is a ranking system of foods based on glycaemic index and carbohydrate content'.
74. It is not known whether the different studies are using the same GI tables, therefore, this should be checked.

**Action: Victoria Burley**

75. It should be explained what the 5 units of glycaemic index (GI) represents on p 224 and mention should be made of the caveats relating to studies on GI.
76. The stroke studies should be omitted from the forest plot on p227 as there are only two

studies and the heterogeneity is above the 75%  $I^2$  cut off.

77. Members agreed that the pooled estimates (1.5a-c page 198-200) were very useful, but further detail is required, for example including the range of intakes and more detailed summary estimates. Total fibre needs to be included in the plot together with current intakes reported in dietary surveys, this would inform the Working Group as to how much the population would have to increase their intakes to achieve these levels.

**Action: Victoria Burley**

78. The Chair highlighted that the sample size stated in the evidence tables should be checked where there have been multiple entries for the same study e.g. p153-4. Members noted that the analysis on sugar-sweetened drinks had not been adjusted for wholegrain and fibre intake, which raises important issues for interpretation of the data.

79. The summary requires re-wording to reflect the types of sugar that the sugar-sweetened beverages contain.

80. Members agreed that the results should be reported consistently through the report for example lower, higher etc, especially where the terms inverse and negative had been used interchangeably.

81. The Working Group noted that Jacobsen et al., 2004 was based on an analysis of actual intakes and not modelled.

82. Members agreed that the Chair would discuss the structure of the report with the Secretariat and comments fed back to the Leeds team.

**Action: Chair and Secretariat**

83. It was agreed that the Leeds team would prioritise work on the diabetes section of the review, which could then be sent to the Working Group in December prior to the next meeting on 28 January 2010. This would allow the members more time to consider the chapter. The obesity section should be submitted to the Secretariat by 7<sup>th</sup> January.

84. The Working Group thanked the Leeds team for their hard work in undertaking such a comprehensive review.

**Agenda item 4- Carbohydrate and Colorectal Health Normal function- Summary (SACN/Carbohydrates/10/19)**

85. Dr Peter Sanderson (PS) introduced the summary of the normal function section and clinical aspects of the colorectal health review. These sections have been amended since they were last discussed by the Working Group.

86. The Chair asked what the Working Group considers as faecal bulking. For example if 1 g of a component is consumed which corresponds to a 1 g increase in faecal output, it would not be defined as bulking.

87. A member suggested that if an effect can be objectively measured, then it could be seen as bulking.

88. It is important to define up front what the Working Group considers as faecal bulking because this is one of the criteria that will be used to establish whether a component can be considered as fibre.

89. A member enquired whether there is a clinical definition of faecal bulking that could be used. PS highlighted that he had looked in the literature for this information, but the only evidence identified was from ecological studies.

90. A consensus on this issue could not be reached with the information currently available to the Working Group, therefore it was agreed to discuss at a later stage.

91. P105, paragraph 217 “..which equates to a 1-2g increase in faecal wet weight per 1g resistant starch, which is considerably less than for dietary fibre” the end of this sentence is too strong and requires re-wording to reflect the evidence accurately.

**Action: Peter Sanderson**

92. A member enquired how inulin had been defined in the report, PS agreed to check this. A member questioned whether there was information on resistant starch intake in the UK. PS commented that figures have been extrapolated from the NDNS and the average is ~2-5g/day. Information on the range of resistant starch intakes in the UK also needs to be included and it was suggested to approach authors to see if they hold this information (P106, paragraph 228).

93. Page 106, paragraph 227- it needs to be clarified whether 10g/day cannot be measured or whether an effect is not observed.

94. It was suggested that text in the summaries are written in full and not abbreviated because people often only read the summary sections.

**Action: Peter Sanderson**

95. PS informed members that a section on diverticular disease had been added to the report, intention to treat analyses had been performed in the IBS section and trials that were not randomised were excluded.

96. There should be consistency in the text when referring to the Rome criteria for constipation.

97. The Chair recommended Dr Mark Beattie should be asked about the term “functional constipation” because in other disciplines the word functional implies some psychological element to an outcome.

**Action: Peter Sanderson**

98. A member raised the issue that fermentable carbohydrates are defined differently in terms of oral health e.g. sucrose, glucose, fructose, therefore it was recommended that the term colonic fermentable carbohydrates is used instead.

99. Table 55 (p106) and elsewhere, be consistent when stating if information has not been provided e.g. in some places NR has been stated and others there is a gap.

100. Page 118, paragraph 248 revise first sentence to read “Data on reported symptoms...”

101. Paragraph 257 should be amended to, “within the scope of the trials reviewed there does not appear to be an effect of trial duration on reported outcomes”. The range of trial duration should also be included in brackets.
102. In the results tables there needs to be consistency with reporting the comparison arms of the included trials.
103. Members requested that the summary sections be reworded to reflect that there is an indication of benefit, however there is a need for more objective evidence to confirm the relationship between carbohydrate intake and colorectal health outcomes. The summary also needs to be briefer and not to over emphasise the clinical aspects.
104. The Chair recommended that advice should be sought from Mark Beattie as to how much of the clinical trials on treatment (e.g. diarrhoea treatment trials) should feature in a report on the prevention of disease.

**Action: Peter Sanderson**

105. A member highlighted that children with diarrhoea in the UK are treated very differently to those in developing countries therefore the applicability of these trials was questioned. Secretariat and Chair to consider whether trials from developing countries should be removed.

**Action: Secretariat and Chair**

106. A member asked whether the IBS trials stated if the cases were post infectious. PS confirmed that this information was not provided and therefore this should be highlighted in the report.
107. Reference should be made to any existing NICE recommendations for diverticular disease and diarrhoea. A member informed the Working Group that there were no guidelines for diverticular disease, but there are for IBS. NICE quote a systematic review on IBS which needs to be referenced in the report.

**Action: Peter Sanderson**

**Agenda item 5- Discussion of SACN fibre definition in relation to data presented in draft papers on carbohydrates and colorectal health and colorectal cancer (SACN/Carbohydrates/10/16)**

108. The Chair informed members that there is insufficient time to discuss SACN's definition of fibre and suggested that it would be more useful to revisit this once the Working Group have received a more complete version of the cardiometabolic health review.

**Agenda item 6- Future Work Programme**

109. No issues were raised under this item.

**Agenda item 7- AOB**

110. The German Nutrition Society (DGE) have published draft guidelines for carbohydrate intake in German. They reviewed the evidence systematically to derive their recommendations.

111. The contents page was tabled at the meeting for information with the key headings translated into English.

112. After further discussion, the Working Group agreed that the Secretariat should request Leeds to include fruit juices in their searches, as these beverages contain sugar.

**Action: Victoria Burley**

113. It was agreed that any further comments on the colorectal health review should be circulated by email before the next meeting. PS to send an updated report in late December.

**Action: Peter Sanderson**

114. The date of next meeting is 28<sup>th</sup> January 2011.

115. The Chair thanked members for their attendance and closed the meeting.