12th MEETING

Carbohydrates Working Group

1st August 2011, Room LG18, Wellington House

135-155 Waterloo Road, London, SE1 8UG

DRAFT MINUTES

Chair:	Professor Ian Macdonald
SACN Members	Dr David Mela
	Professor Ian Young
	Professor Julie Lovegrove
	Professor Angus Walls
	Professor Ian Johnson
	Dr Mark Beattie
	Mrs Christine Gratus
Other attendees:	Dr Victoria Burley (University of Leeds) (items 4 and 5 only)
	Ms Diane Threapleton (University of Leeds) (items 4 and 5 only)
	Dr Peter Sanderson (items 2 and 3 only)
Observer:	Dr Gillian Purdon (FSA Scotland)
Secretariat:	Dr Elaine Stone
	Mrs Vicki Pyne
	Ms Emma Peacock

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Chair's introduction and welcome

1. The Chair welcomed members to the 12th meeting of the SACN Carbohydrates Working Group.

2. Apologies were received from Dr Alison Tedstone, Professor Tim Key and Ms Alison Eastwood.

3. The Chair asked members for any changes in their declarations of interest; none were given.

Agenda item 1 – Minutes of the 11th meeting (SACN/Carbohydrates/11/min/02)

4. Members were invited to comment on the minutes of the 11th meeting of the Carbohydrates Working Group. Members agreed that the minutes are an accurate record of the meeting and had no further comment.

Matters arising (SACN/Carbohydrates/11/08)

5. Dr Elaine Stone introduced the matters arising.

Matters Arising – Carbohydrates and colorectal/oral health review

6. Members were informed that the Secretariat is currently checking 10% of the excluded studies of both the colorectal and oral health reviews.

Matters Arising – Carbohydrates and colorectal health review

7. The reviews that informed the IoM vitamin D report have been published on the Agency for Healthcare Research and Quality's website. For the Carbohydrates and Health Report, it is anticipated that the full systematic reviews will be published on the SACN website as appendices.

8. The Chair highlighted the need for the reviews to be copyrighted to ensure that SACN's work is protected.

9. Andrew James presented a summary of the statistical methods used in the colorectal health review at the main SACN meeting in June.

Agenda item 2 – Carbohydrates and oral health review

10. Professor Angus Walls informed members that he has started collating a list of dental terms, however he will complete this once the oral health review has been drafted in its entirety.

11. The data extraction process will be checked by the Secretariat over the next few months.

12. Professor Angus Walls asked his colleague how they had treated studies that had not adjusted for oral hygiene in the WHO review of dental caries and sugars. It was noted that studies had been included regardless of whether the authors had adjusted for oral hygiene.

13. The Chair and Professor Angus Walls had advised Dr Peter Sanderson on how to progress the oral health review.

14. Professor Angus Walls had circulated the paper by Professor Andrew Rugg-Gunn to members.

Agenda item 3 – Carbohydrates and cardiometabolic health

15. Professor Ian Young will send the Leeds team a power calculation for CRP in August.

16. The Secretariat has identified studies from the relevant COMA report and are currently assessing whether they meet the inclusion criteria for the cardiometabolic health review.

DRAFT

Agenda item 2- Draft carbohydrates and oral health review; dental erosion and revised dental caries section (SACN Carbohydrates/11/09).

17. The Chair welcomed Dr Peter Sanderson (PS) and invited him to introduce the draft review on carbohydrates and oral health.

18. PS informed members that the review contained a revised section on dental caries and a new section on dental erosion.

19. Members were invited to comment on the paper.

20. Page 7, paragraph 15- it states that forest plots will be used to present data, however, there are currently no forest plots in the review. This paragraph should be amended.

Action: Peter Sanderson

21. Professor Walls explained the term non-cavitated lesions to the Working Group. Tooth demineralisation can occur underneath the enamel without breaking to the surface and can be reversed by re-mineralisation. If this occurs, it presents as a white spot. If overt cavitation occurs due to excessive tooth demineralisation, the process cannot be reversed and the cavity will require filling. Members were informed that non-cavitated lesions should be included as an outcome in the oral health review because they are part of the caries process.

22. A member asked if these lesions can be reliably detected. The Working Group were informed that if they are present on a smooth surface and the tooth can be adequately dried, the lesions are easy to detect as they appear as white lines or spots. If the individual does not change their oral hygiene practice, a cavity will develop.

23. Page 13-14, tables 1 and 2- the funding source column should be moved to the end of the table to be consistent with the cardiometabolic health review.

24. Members discussed the exclusion criterion of "subjects not healthy", as described on page 16 of the oral health review.

DRAFT

25. It was highlighted that subjects may suffer from a particular disease condition, but it may not be associated with the risk of dental caries.

26. A member commented that health is a continuum and there is not always a clear cut off between healthy and unhealthy. Therefore, a clear distinction of what is considered healthy cannot be made.

27. A member noted that studies conducted several years ago might not currently be deemed ethical. Members discussed this issue and concluded that this would not provide sufficient grounds on which to exclude studies, since they would have been considered ethical at the time.

28. It was noted that the wording of the exclusion criterion has confused the issue. A member suggested using the term "diseased" rather than "not healthy" would overcome this problem.

29. This exclusion criterion relates to four studies: Gustafsson et al., 1954, Dunning & Hodge 1971, Finn et al., 1978, Honkala et al., 2006. Members agreed that the disease status of the subjects in these studies should be identified for further consideration.

Action: Peter Sanderson

30. It was noted that studies which are 60 years old will be very different in design and it was suggested that consideration be given to excluding them from any statistical analysis, but inclusion in the narrative.

31. Members requested that studies on dental caries included by COMA should be identified so a comparison can be made.

Action: Peter Sanderson

32. Page 29, paragraph 93- check the p-value for the results presented.

33. Page 29, paragraph 94- it was suggested to refer to caries rather than caries increment.

DRAFT

34. PS highlighted that there is a trial comparing a sucrose intervention to a polyol intervention and queried whether polyols are considered as appropriate controls. To investigate this issue non-randomised trials may need to be considered.

35. The EFSA opinion on polyol containing sugar free gums states that it is associated with a reduction in tooth mineralisation and the incidence of caries. The opinion attributes the effect to sugar-free gums but not to sorbitol or xylitol.

36. A member noted that there are very few studies comparing the effects of sugar-free gums, polyol and sucrose containing gums; therefore, it is impossible to determine whether gums primarily sweetened with polyols are better at preventing caries than gums sweetened primarily by intense sweeteners.

37. If gums sweetened with either polyols or intense sweeteners gums are shown to have different effects compared to sugar-sweetened gums, it was suggested to comment on this but not to analyse further because this is a review of carbohydrate components of the diet.

38. It was commented that the Working Group still need to address the question of whether sucrose is having a detrimental effect or if polyols are showing a beneficial effect. Is there a mechanistic reason for sugar alcohols to be considered neutral or not in terms of their risk for dental caries?

39. Members were informed that theoretically polyols could confer some benefit, however the doses used in these trials may not be large enough.

40. A member highlighted that the act of chewing gum itself is beneficial due to increasing salivary flow, which increases the pH of the mouth, therefore assumptions cannot be made without further consideration of the evidence.

41. Members requested that a supplementary paper is prepared including the non-randomised trials so that the Working Group can deliberate the effect of polyols further.

Action: Peter Sanderson

42. Page 31- delete the word therapeutic.

43. It was noted that some exposures listed in the search terms have not been included in the narrative summary. If no studies have been identified for a particular exposure, this should be clearly stated in the text.

Action: Peter Sanderson

44. Page 37, paragraph 107- it is not clear which report the 52% of five year olds comes from.

45. Page 37, paragraph 108- rephrase the last sentence, as it is unclear.

46. The information in paragraphs 110-113 relate to dental caries, therefore it was recommended that these are moved to the introductory section at the beginning of the review.

47. Members were informed that caries occurs at a pH of 4-5.5; whereas erosion will only happen at a pH 2.

48. A member questioned the use of enamel blocks in studies.

49. The Working Group were informed that teeth are uniformly attacked by acid, therefore there is no reference point against which to compare the rate of tooth wear. The use of enamel blocks allows a fixed point of measurement, but not on natural teeth. This is not an ideal measure, but it is the best method currently available. Two major caveats to this method were noted:

- Some blocks use bovine or porcine enamel, but this should not be an issue when making between group comparisons.
- The way in which the block is prepared does not reflect the surface of the tooth as it would appear in the mouth.

DRAFT

50. Page 42, paragraph 127 rephrase as the information on calcium is unclear.

51. Studies assessing remineralisation are investigating caries rather than dental erosion, therefore these should be moved to the caries section of the review.

52. The studies reviewed on page 55 need to be included in the dental caries section.

Action: Peter Sanderson

53. In table 18, it was noted that the control group in the Rugg-Gunn study is different.

54. A member asked what intervention the control group received; members were informed that most studies used distilled water.

55. A member highlighted that there are no studies directly comparing the effect of drinks sweetened with sugar vs. intense sweeteners on dental erosion. From the studies included in this review, the depth of erosion can be compared between the study arms and an inference made from these observations. This issue should be captured in the review.

Action: Peter Sanderson

56. A member drew attention to the short duration of the dental erosion studies.

Agenda item 2- Articles not adjusting for tooth brushing (SACN/Carbohydrates/11/10)

57. At the April meeting members noted that around half the studies in the dental caries section has been excluded because they had not controlled for tooth brushing. PS has now identified papers from his search that have investigated dental caries, but did not adjust for tooth brushing in their analysis.

58. The Chair asked PS to summarise how the results differ from those studies already included in the oral health review. PS noted that there appears to be little difference in the outcome.

DRAFT

59. It was requested that a paragraph is included in the report to state that a comparison has been made between those studies that have not adjusted for oral hygiene and those that have; both of which produce similar findings. This demonstrates that the Working Group have considered the available literature. Consideration should also be given to including information on these studies as an annex to the review.

60. A member suggested that the above statement is also included in other sections, such as infant feeding.

Action: Peter Sanderson

61. The Chair asked members if they were happy to acknowledge the studies excluded on the grounds of not adjusting for oral hygiene in the manner proposed. Members agreed with this course of action.

62. A member highlighted that there is no commentary on root caries in the review. From current knowledge of the evidence base, there are no trials on root caries and only one or two prospective cohort studies. The majority of studies in this area are cross sectional in nature. The Chair was asked if this evidence could be captured since it would be remiss not to include root caries in the oral health review.

63. The Chair agreed that a narrative description of the cross sectional data on root caries should be included as an annex to the review in order to give an overall picture of the field.

Action: Peter Sanderson

64. The Chair informed members that the periodontal and oral cancer sections will be presented at the October meeting with a view to the oral health review going to the main SACN meeting in February 2012.

Agenda item 3- Discussion on draft carbohydrates and colorectal health report – clinical section (SACN/Carbohydrates/11/11)

DRAFT

65. The Chair noted that at the main SACN meeting in June concern was raised about some aspects of the clinical section being outside SACN's remit because the focus appeared to be on treatment of disease, rather than prevention. Therefore, the Working Group need to discuss and decide what outcomes the colorectal health review should include.

66. The Chair asked Dr Mark Beattie (MB) for his advice on the matter. He noted that diverticular disease and IBS are recognised functional diseases of the gastrointestinal tract. IBS ranges in severity from 'normal nuisance' to 'severely incapacitating'. He also questioned what was actually meant by healthy subjects, as health is a continuum from health to disease. If SACN are only considering truly healthy individuals, it would exclude approximately half of the population.

67. A member highlighted that excluding pre disease states would potentially exclude those with hypertension and hypercholesterolemia; however, these are included in the cardiometabolic review. It was also noted that these population groups are already shifting towards the disease end of the spectrum.

68. MB advised omitting studies which investigate either the management or treatment of diarrhoea from the colorectal health review.

69. The Working Group's objective is to identify whether there is a dietary carbohydrate aspect that can prevent progression, for example the prevention of the initiation and progression to diverticular disease through carbohydrate intake. It was noted that prevention of constipation may reduce the incidence and severity of diverticular disease.

70. A member commented that a large proportion of the population suffers from constipation, which is included as an outcome in the clinical section, and increasing carbohydrate intake can both prevent and reduce the symptoms of the condition.

71. It was suggested that a clear statement should be made in the colorectal health review providing the rationale for why certain conditions have been included.

Action: Peter Sanderson

DRAFT

72. A high proportion of the population suffer from IBS and diverticular disease, therefore they are conditions that are applicable to the general population and so the review should consider the prevention of these conditions.

73. A member advised that diverticulitis should not be included in the colorectal health review because it is an advanced form of diverticular disease involving inflammation of the diverticula and would require treatment in order to mediate the disease process. However, diverticulosis occurs earlier along the disease spectrum where progression to more advanced disease can still be prevented.

74. It was suggested that the Working Group comment on the available evidence for prevention of IBS and diverticular disease.

75. It is important to note whether the trials in this section have used interventions that can be achieved through diet.

76. The Chair advised that this section should not be presented as a clinical chapter. Instead it should be renamed “Prevention of impaired colorectal function”.

77. A member commented that there is a fine line between disease and health, therefore judgements on which health/disease outcomes SACN should consider needs to be done on a case-by-case basis.

78. Members agreed that the Working Group’s rationale for considering some pre-disease states along the health-disease spectrum should be presented to SACN at the October main meeting because it is applicable to all of SACN’s work.

Action: Chair/ Secretariat

DRAFT

79. It was agreed that studies on prevention of diverticular disease and prevention of IBS and diarrhoea induced by high fructose consumption should be included in the review. Studies on management of diarrhoea via oral rehydration solutions, treatment of infectious diarrhoea and diverticulitis should be excluded.

Action: Peter Sanderson

80. PS highlighted that in this section of the review there are trials investigating the prevention of traveller's diarrhoea. The Chair agreed that these studies should be included.

81. The Chair noted that at the June SACN meeting it was questioned whether studies investigating psyllium should be included. As psyllium is present in a number of food products and is a naturally occurring soluble fibre, it was considered applicable to all the reviews. Members agreed that psyllium should still be included as an exposure.

Agenda item 3- Discussion on draft carbohydrates and colorectal health report – dose response analysis (SACN/Carbohydrates/11/12)

82. The Chair drew member's attention to the summary table comparing the results of the highest vs. lowest quantile and dose response meta-analyses prepared by PS.

83. PS summarised the risk estimates presented for colorectal cancer and dietary fibre. It was noted that the pooled analysis by Park et al., 2005 could not be included in the dose response analysis, however, the results from both approaches yielded similar results.

84. Members were asked which method should be included in the review. It was suggested that the results from both should be described.

85. It was highlighted that both the Leeds team and DH statisticians considered the dose-response method to be more informative than the highest vs. lowest quantile method.

86. The Chair requested that an explanation is obtained from the DH statistician as to why

DRAFT

dose-response is the preferred approach.

Action: Secretariat

Agenda item 4- Draft carbohydrates and cardiometabolic health review- markers of cardiovascular disease- vascular function (SACN/Carbohydrates/11/15)

87. The Chair welcomed Dr Victoria Burley and Ms Diane Threapleton to the meeting. Victoria Burley introduced the draft chapter on carbohydrates and vascular function.

88. Members were invited to comment and the following suggestions were made:

- To use the term pulse wave analysis rather than augmentation index
- Use the term carotid intima-media thickness instead of carotid plaque index.
- Change the order of the background so that aortic calcification and carotid intima-media thickness are listed in sequence and all the functional markers are grouped together.
- Include a few paragraphs in the introduction explaining the relationship between vascular function and cardiovascular disease (CVD).
- Change the title of the last column in table 2.28 to 'source of funding'.
- Pages 12 and 20- remove studies on markers of oxidative stress because they are not measures of vascular function.
- Page 13- expand the outcome/assessment method column of table 2.31.
- Remove the word 'arm' from "arm weight change" column throughout the tables to improve clarity.
- Page 18- remove the trial measuring asymmetric dimethyl arginine (ADMA) as this is not relevant to this section.
- The Atherosclerosis Risk in the Community (ARIC) study on page 22 should be included as part of the CVD chapter.
- Page 22- remove the trials measuring markers of antioxidant status or oxidative stress as these are not relevant to this section.
- Page 25- include information on the change in GI actually achieved.

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Action: Victoria Burley

Agenda item 5- Draft carbohydrates and cardiometabolic health review- markers of CVD- Blood Pressure (SACN/Carbohydrates/11/14)

89. Victoria Burley introduced the draft chapter on carbohydrates and blood pressure.

90. Members were invited to comment on the chapter.

91. The introduction needs to explain that there is a continuous relationship between blood pressure and cardiovascular outcomes.

Action: Victoria Burley

92. A member commented that they were unsure of the underlying mechanism for relating carbohydrate intake and blood pressure (ie why it was an association considered plausible). Members were informed that insulin has been proposed to have a direct effect on hypertension.

93. The background should focus more on blood pressure because currently the emphasis is more on hypertension. Hypertension should only be a section of the blood pressure section.

94. Page 12, table 2.2- the title of the last column needs to be amended to source of funding.

Action: Victoria Burley

95. It was noted that some of the wholegrain studies did not adjust for BMI. This was highlighted in the text for ease of reference.

96. Page 47, table 2.10- the word ‘sugar’ should be removed from the title.

Action: Victoria Burley

DRAFT

97. A member queried whether the Golay et al. (2000) study on page 51 should be included as it is a food combination trial (thus manipulating variables other than just diet composition). Members agreed that this study should still be included, but the results should be interpreted with caution.

98. Members noted that de Luis et al. (2008, 2009) investigated the effect of different polymorphisms.

99. Members queried how trials were defined as being primarily protein or fat substitution studies and what was used. It was agreed that it would be useful for the forest plot to have an axis at the side, stating % energy as fat etc., or even to order by this variable, if this is the focus of the analysis.

100. Revise the first sentence on page 55, because it implies that only protein was altered in the diet.

Action: Victoria Burley

101. Page 100, summary of RCT data- last sentence of first paragraph should read ‘unblinded’.

Action: Victoria Burley

102. A member highlighted that Raben et al. (2002) is a supplementation study where subjects were asked to consume drinks in addition to their normal diet. This type of study design is different to the dietary manipulation or substitution trials and should be noted in the text.

103. The data for Pereira et al. (2004) should be checked because the changes in diastolic and systolic blood pressure appear to be in different directions in the meta-analysis.

104. Any weight loss occurring in the trials needs to be taken into account because this could contribute to a decrease in blood pressure.

DRAFT

105. Page 125- the term complex carbohydrate should be changed or have quotation marks around it because the term is somewhat outdated and subject to variable interpretation (no agreed definition).

Action: Victoria Burley

Agenda item 5- Draft carbohydrates and cardiometabolic health review- markers of CVD- Energy Intake and Satiety (SACN/Carbohydrates/11/13)

106. Victoria Burley introduced the draft chapter on energy intake and satiety, explaining that the introduction was still to be drafted.

107. The Working Group noted that table 6.1 on page 4 described the interventions included in previous COMA reports. The current inclusion/exclusion criteria have been applied to determine if the studies would be eligible for inclusion in this review. The reasons for exclusion have been stated. A member suggested that the reason for excluding Mensink and Katan (1987) should be checked.

108. Members agreed that the title ‘Subjective and objective measures of appetite’ should be amended to ‘Eating motivation’.

Action: Victoria Burley

109. The Chair expressed concern about the applicability of the results from the National Weight Control Registry (NWCR) cohort to the general UK population. In the NWCR, the subjects were selected on the basis of achieving considerable weight loss. It was agreed that members would have to be cautious about drawing conclusions from this cohort.

110. Members noted that the risk of bias section on page 8 was still to be drafted.

111. It was highlighted that some studies appear to be manipulating protein, but it was not always clear if the intervention is targeted at fat or protein substitution. It was agreed that some criteria should be set to determine how trials are defined.

DRAFT

Action: Victoria Burley

112. Members discussed that energy intake is not the primary endpoint in a number of studies. It was agreed that these studies should remain in the meta-analysis because it is an issue, which is applicable to a number of outcomes in this review. Members agreed it would be useful to identify those studies that assess energy intake as the primary endpoint in the text, however it was noted that this would have to be done throughout the review.

Action: Victoria Burley

113. Page 83, 4th paragraph- the word 'than' should be inserted after other in the first sentence.

Action: Victoria Burley

114. Members noted that two further studies are still to be included in the meta-analysis on energy intake and dietary sugars on page 85.

115. A member highlighted that Raben et al. (2002) and Reid et al. (2007) are supplementation studies and, therefore, different from the other trials. It was agreed that separate meta-analyses should be presented for substitution and supplementation trials.

Action: Victoria Burley

116. A member enquired whether a dose response analysis could be conducted on the meta-analysis on page 98. It was agreed that this would be investigated.

Action: Victoria Burley

117. A member raised the issue that energy can be supplied to the body directly from carbohydrates, but also through fermentation of oligosaccharides. It was agreed that this will be highlighted in the text.

118. Page 115- check the units for Paxman et al. (2008). It was noted that studies quote different units for energy and it was agreed the units should be made consistent in the report.

Action: Victoria Burley

119. Page 128- it should be noted that in the text that Mattes et al. (2002) is a meal replacement study.

120. A member noted that Dumesnil et al. (2001) manipulated the amount of dietary protein as well as GI.

121. A member queried whether appetite was assessed postprandially or over the whole course of the day. It was agreed that the Leeds team would check if the studies could be separated by how appetite was measured.

Action: Victoria Burley

122. Members agreed that the conclusions on protein and fat on pages 145 and 146 should be brought together.

123. It was agreed that the overall conclusions on energy intake and appetite should be summarised together.

124. Members agreed that the chapter would be easier to read if energy intake and appetite are discussed for each carbohydrate exposure instead of being in separate sections.

Action: Victoria Burley

125. Victoria Burley informed members that the lipid chapter and the revised chapters on CVD, markers of CVD and inflammation would be presented at the October meeting. In January the Working Group will consider the revised diabetes, obesity and energy intake/satiety chapters.

126. The Chair thanked Dr Victoria Burley and Ms Diane Threapleton for attending the meeting.

DRAFT

Agenda item 6- AOB

127. The Chair raised the issue about being consistent between reviews around what the Working Group considers a significant finding. This needs to be agreed by the Working Group.

128. A member noted that this was a wider issue as there needs to be consistency in all of SACN's work.

129. It was agreed this issue should be addressed at the main SACN meeting in October.

130. A member recommended obtaining views from DH statisticians.

Action: Secretariat

131. The date of next meeting is 21st October 2011.

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

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