



Scientific Advisory Committee on Nutrition

3rd MEETING

2 December 2005, Conference Room 2, Aviation House

125 Kingsway, London, WC2B 6NH

MINUTES

- Chairman:** Professor Alan Jackson
- Members:** Dr Anthony Williams
Professor Chris Riddoch
Professor Andrew Prentice
Professor Marinos Elias
Professor Christine Williams
Ms Stella Walsh
Professor Joe Millward
Professor Ian MacDonald
Professor Tim Cole
- Secretariat:** Dr Alison Tedstone (FSA)
Dr Peter Sanderson (DH)
Dr Sheela Reedy (DH)
Ms Saadia Noorani (FSA)
- Apologies:** Professor Prakesh Shetty
Ms Gillian Swan (FSA)
Mr Clifton Gay (FSA)
Dr Anita Thomas

Chairs' introduction and welcome

1. The Chair welcomed members to the third meeting of the SACN Working Group on Energy. The Chair also welcomed Professor Ian MacDonald to his first meeting as a new member of the Group and Professor Tim Cole who had been invited to give a presentation on the use of predictive equations for the estimation of basal metabolic

rates.

Minutes from previous meeting (14 September 2005) - SACNenergy/05/min02

2. Members were invited to comment on the minutes of the previous meeting. The following changes were requested:
3. *Apologies* - Professor Ian Macdonald to be included.
4. *Paragraph 14* – Deletion of the words ‘which gave some confidence in the data obtained from the diaries’ in the second to last sentence.
5. *Paragraph 21* - The words ‘physical activity levels might have increased, possibly in a bimodal fashion’ in paragraph 21 to be changed to ‘physical activity levels may have changed, possibly in a biomodal fashion’
6. *Paragraph 9* - The words ‘energy requirement recommendation’ to be changed to estimated average requirements.

Action: Secretariat

Commentary on adult BMR analysis- SACNenergy/05/13

7. Professor Tim Cole gave a presentation on the use of the ‘seamless’ predictive equation for the estimation of basal metabolic rates (BMR), using the Oxford Brookes database. The seamless analysis allows adult and child data to be combined; the BMR data are transformed to their logarithmic values for the analysis.
8. It was noted that there was large interstudy variation in the database, with some studies reporting values outside the predicted range. The effect of body composition, in relation to weight and height, on BMR was discussed. It was noted that the older data sets contained few overweight or obese individuals unlike the general population. In studies where fat-free mass and fat mass were measured, a curvi-linear relationship between weight and BMR has been observed, with increasing weight reflecting differences in body composition (increasing fat mass relative to fat-free mass). A linear relationship was observed in the Oxford Brookes dataset, however, due to heterogeneity between studies. It was also noted that any effect of ethnicity was obscured in the dataset.

9. It was noted that the dataset employed was very noisy and estimating variability was prone to bias. The quality of the studies in the dataset needed consideration. The Committee requested that the seamless predictive equation should be applied to other datasets, especially those using modern doubly labelled water experiments of relevant population groups.
10. It was suggested that a dataset should be compiled using modern doubly labelled water experiments. The need for data from certain stages of life, e.g. young children, in growth transitions (adolescence) and in older people, was noted. The dataset should initially be restricted to 'normal' subjects, but overweight and obese subjects should also be considered.

Action: Secretariat

11. Members discussed the extent to which the Oxford Brookes database could be applied to modern population groups. It was noted that the timing of the adolescence growth spurt and the elderly ageing process have both changed. There has also been a large increase in the number of obese and overweight people in the population since some of the earlier studies in the database had been conducted. It was noted that if the database were applied to the current population, uncertainty and measurement adjustments would need to be considered.
12. Although this equation is more complex than those currently in use, it is applicable to all age groups and potentially more robust than age-specific predictions of BMR. The equation would be further revised to better fit the data.

Physical activity and health -SACNenergy/05/14

13. Professor Chris Riddoch led a discussion on the evidence underpinning the impact of physical activity on health, taken from the Chief Medical Officer's report, *At Least 5 a Week*. The recommendations of the CMO report were based on prospective epidemiological studies with disease outcome data and therapeutic intervention trials with disease risk factor outcome measures. The report had taken a life course approach, with recommendations for specific age ranges.
14. The following points were noted:
15. Virtually all chronic diseases have has been inversely associated with physical activity.

16. Physical activity is a behaviour, which is difficult to measure. A limitation in many studies, especially those of childhood physical activity, has been the inaccuracy of the exposure measure, i.e. the use of self-reported physical activity levels.
17. Few studies have looked at physical activity and obesity. The majority of studies were in white males with few studies in children, females and different ethnic groups.
18. The associations observed between lower physical activity levels and increased risk of chronic disease are of a similar magnitude to those observed for smoking and chronic disease. The health benefits of physical activity are not maintained if a person reverts to an inactive lifestyle.
19. There are benefits to health associated with higher levels of physical activity, which are independent of whether a person is overweight or obese: an inactive lean person is still at increased risk of chronic disease. It was noted that studies of physical activity often controlled for obesity, but many obesity studies did not control for physical activity.
20. The shape of the dose-response curve for physical activity and chronic diseases – most notably CHD – indicated that the greatest reductions in risk are obtained by moving from the sedentary group to the next most active group. There also appears to be an upper activity threshold – around an energy expenditure level of about 2000 kcal a week – above which little added health benefit accrues. It was also noted that different modes and amounts of activity have different effects on different outcomes (e.g. bone health, obesity, cardiovascular disease and mental health). The current recommended level of activity (30 minutes of moderate intensity activity on at least 5 days per week) has been established as the level that achieves most of these benefits.
21. It was suggested that the report should include a table of physical activity recommendations for different life stages and the associated health benefits. It was noted that the evidence base that underpinned the recommendation of 30 minutes moderate intensity activity on 5 days a week was robust. It was estimated that an increment in PAL of 0.2 for an adult approximated an energy expenditure of 2000kcal a week.
22. It was observed that the term physical activity and fitness are often used interchangeably. It was agreed to use the term *physical activity* in the energy report.

Energy requirement of illness -SACNenergy/05/15

23. Professor Marinos Elia gave a presentation on energy requirements during illness.
24. It was noted that the prevalence of illness increases with age and large numbers of

older people are ill and obese or overweight.

25. The distribution of BMR is more variable in disease than in health, with certain traumas, such as major burns, causing a large increase in BMR. Overall, however, the decrease in physical activity due to illness results in a reduction in the energy requirement despite small effects on BMR seen in most illnesses. It was noted that the strict control of blood glucose concentrations reduced morbidity and mortality in patients on total parenteral nutrition and that there was a need to be cautious about overfeeding in the early stages of disease. It was suggested that recent nutrient intake could affect the clinical outcome of the patient, e.g. collagen deposition in wound healing.
26. It was noted that a significant proportion of the UK population are overweight and ill and that these issues would need to be considered in the report.
27. Issues of reduced micronutrient intakes with reduced energy intakes, e.g. in illness, and low micronutrient intakes and low physical activity levels in young women were highlighted for consideration in the report.

Outline of report structure-SACNenergy/05/16

28. The general outline of the report was agreed.
29. The next meeting was scheduled for 3 April 2006.