

Introduction

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Recommendations of experts on energy requirements throughout the life cycle are essential for assessing whether food supplies are adequate to meet a population's nutritional needs. Developed and industrialised countries have the resources, both scientific and financial, to convene their own committees of experts to provide scientific advice on topics related to nutrient requirements, as well as specifically addressing their own public health and nutritional issues. On the other hand, developing countries often lack both the human and economic resources to hold such meetings and it is the mandate of United Nations (UN) organisations such as the Food and Agriculture Organization (FAO) to provide a neutral and independent forum for scientists representing the wider interests of the global community to meet and deliberate on recommendations that are universally applicable to all nations taking into consideration the specific problems that developing countries face. Hence, the development of pragmatic recommendations by expert committees convened by UN agencies which are based on objective scientific evidence, and which have practical relevance to the conditions prevailing in the developing world, are paramount.

During the process of deliberating on human energy requirements the question of 'requirements for what?' needs to be constantly borne in mind. While biological scientists generally are concerned with the physiological basis of estimating requirements, it is necessary to be aware of the practical applications in the real world of these recommendations for populations worldwide. The stated objective of expert consultations on human energy requirements convened by FAO since the 1950s (most often with the World Health Organization (WHO), and more recently with the United Nations University (UNU)) is to provide advice to the Director-Generals, and through their respective organisations to their member countries, on scientific issues related to food energy. The purpose of expert consultations on human energy requirements is to provide international agencies and their member countries with the necessary tools for addressing practical nutrition-related questions, such as the assessment of the adequacy of food supplies and the number of people who do not attain adequate energy intake, to draw up targets for food production and to inform national food and nutrition policy. The recommendations and

guidelines, which result from these consultations, will serve in enabling governments and organisations to better plan, monitor and evaluate nutrition programmes and policies. In turn, these may aid member nations in developing estimates of requirements appropriate for local conditions and for their relevant and direct applications in their own countries.

The entire process leading to the convening of an expert group and the resulting consultation is highly formalised with a number of required protocols. Hence, for the first time we adopted a two-stage process by convening working groups in areas where there was new scientific knowledge which might influence the current recommendations for energy needs. The groups were provided with a series of working background documents which were also made available subsequently to the expert consultation process. As requested by the participants of this two-stage consultative process and to ensure the objectivity and the transparency of this process, a decision was made quite early on to ensure that all background documents were published in a peer-reviewed scientific journal. The added advantage was that the report of the Expert Consultation¹ could be short and prescriptive while the publication of the background documents would provide the scientific justification for the prescriptive recommendations contained in the report. This would also ensure the objectivity and transparency of the consultative process².

The rationale for a two-stage process was the need to resolve many of the scientific questions which could be dealt with by the active contribution of experts in those specific areas whose participation at the expert consultation *per se*, was uncertain due to the need to conform in providing a globally representative expert panel. It also facilitated discussions since any contentious issues were debated and settled and the results of which benefited the expert consultation itself. These working groups met between 27 June and 5 July 2001, at FAO Headquarters in Rome several months before the experts met in October 2001. Three of the working groups focused primarily on energy requirements through the life cycle and related to two important sub-populations, i.e. infants and children and pregnant and lactating women, where substantial scientific advances had been made. These were: (1) Working group on energy (and protein) requirements of infants and pre-school children, and (2) Working group on

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energy (and protein) requirements of pregnancy and lactation. A third working group looked at food energy values and was designated (3) Working group on analytical issues in food energy and composition: energy in food labelling, including regulatory and trade issues. An additional working group was constituted to provide documentation in the form of reviews on methodologies used in the field of energy balance (i.e. dietary consumption and intakes, body composition and energy expenditure). However, it was felt, given the nature of the task, that there was no need for the group to meet although the background documents commissioned were available to the expert consultation and are also published in this volume.

The chairpersons of all the relevant working groups on energy were also invited to the expert consultation to present a summary of their deliberations and recommendations and to advise the experts. Background papers which had been commissioned and peer-reviewed were made available to both the pre-consultation working groups as well as to the experts who met for the actual consultation from 17 to 21 October 2001 in Rome. The entire consultation process, including the pre-consultation activities proceeded smoothly despite a few hitches largely due to the unhappy events of 11 September 2001 and the resulting inability of some of the invited experts to join the consultative process in Rome. The list of the participants in the various working group sessions and those invited as experts to the consultation are listed in Annex 1 of the *Human Energy Requirements* report published in 2004¹, while Annex 2 provides details of the authors and reviewers of the background documents. These background documents are published in this supplement of *Public Health Nutrition*.

An important recommendation of the expert group was to include an update and review of the predictive equations to estimate basal metabolic rate (BMR) and to incorporate the updated equations into the new recommendations. The activities that constituted fulfilling this important recommendation of the experts was time consuming since it involved updating the global database on BMRs originally obtained for the 1985 report³, its re-analysis with particular emphasis on looking at the influence of methodological biases and ethnic variations, and to develop new BMR predictive equations with better predictive performance for international use. The re-analysis was followed by an exercise to test the validity of the new equations as well as a further consultation with a sub-group of the expert panel for their final decision. However, after this fairly long drawn out exercise the experts concluded that the international equations hitherto used continued to have enhanced precision and robustness. Therefore, the recommendation following the re-analysis of the updated global database to use a seamless single predictive BMR equation was not considered practical. Hence it was insufficient to

persuade the expert consultation to warrant discontinuing use of the international equations provided in the 1985 report and widely used internationally since then. Consequently, the present report's recommendations¹ are to continue the use of equations previously used in the 1985 report³. Several of the published background documents in this issue of the journal cover this important process^{4–6}. In addition, a review of the global data on energy cost of physical activity was also commissioned for the 2001 Consultation and is reproduced here in its entirety⁷ since only a summary of the data is provided in Annex 5 of the final report of the 2001 expert consultation¹.

One other recommendation endorsed by the 2001 Consultation related to analytical issues in food energy and food composition. FAO convened a technical workshop on 'Food energy – methods of analysis and conversion factors' which was held in Rome from 3 to 6 December 2002 and the report of which has since been published⁸ and complements the energy report¹. The background documents which formed part of the consultative process and specifically addressed issues deliberated at the technical workshop do not feature in this supplement.

Additional material in the form of opinion pieces or reviews were requested by the experts on specific topics such as additional requirements for infections in children and the impact of undernutrition on mental development which are also published here. Other papers that were not specifically solicited by the joint secretariat but were made available to the experts^{9,10} or sent by the authors for the consultative process are also referenced below¹¹. These publications are not reproduced in this special issue.

References

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- 9 American Heart Association. *Physical Activity and Cardiovascular Health: How Much Physical Activity is Enough?* 2002. www.americanheart.org/.
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