

Joint Irish Section and American Society for Nutrition Meeting, 15–17 June 2011, 70th anniversary: 'Vitamins in early development and healthy ageing: impact on infectious and chronic disease'

## Macronutrients and weaning: an assessment of three books used for weaning guidance in Ireland

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A shortfall in knowledge and a desire for specific guidance on weaning (defined as the transition from milk to solid foods) have been identified among parents in Ireland. Continued breast-feeding alongside the addition of solid foods close to 6 months is recommended in order to meet macronutrient intake goals without supplying excessive nutrition, and so, avoid the down-stream metabolic consequences of rapid early life weight gain<sup>(1,2)</sup>. Preliminary work by this group identified three self-help books used by parents for detailed weaning guidance. The aims of this study were to evaluate the macronutrient content of hypothetical 7-d food intake patterns developed from these books for various stages of weaning.

Weights for boys and girls at seven centiles (0.4th, 2.5th, 25th, 50th, 75th, 91st and 99.6th) at ages corresponding to key stages in the weaning process (5, 7.5, 10.5 and 12 months) ( $n$  56 infants) were derived using the UK-WHO growth charts<sup>(3)</sup>, and used to calculate fluid and nutrient goals. Seven-day food and breast milk intake patterns were developed from the three books on weaning using minimal added fat and sugar, for the four key stages outlined above, for the 56 infants ( $n$  168 7-d food and breast milk intake patterns). Intakes of energy, protein, carbohydrate, total fat and DHA were compared with established nutrient intake goals from the Institute of Medicine<sup>(3)</sup> and The European Food Safety Authority<sup>(4)</sup>.

Seven-day food intake patterns from each of the three books assessed provided energy (Fig. 1), protein (Fig. 2), total fat (Fig. 3) and carbohydrate (data not shown) intakes above the set goals. Protein intakes increased significantly with age ( $P = 0.001$  for all three books); at 12 m Book-1, Book-2 and Book-3 provided 18, 18 and 16% of median % energy intake from protein, respectively. This increase corresponded to a decrease in % energy from fat, so that at 12 months, median % energy from fat intakes was 41, 43 and 40% from Book-1, Book-2 and Book-3, respectively. The DHA intake goal was only achieved by 7-d food and breast milk patterns that included oily fish.

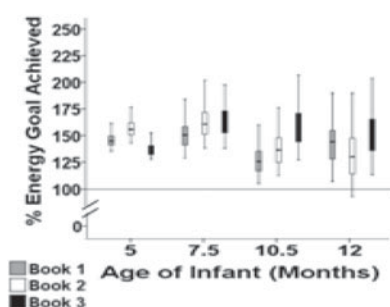


Fig. 1. % Energy goal met.

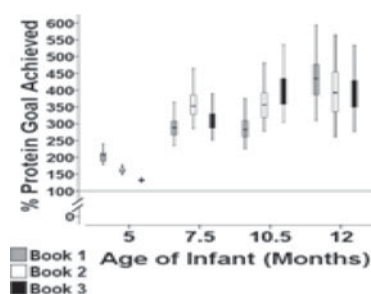


Fig. 2. % Protein goal met.

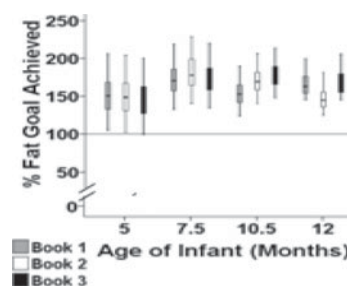


Fig. 3. % Total fat goal met.

This work has confirmed best practice guidelines in infant feeding, which stress that the use of added fat (e.g. butter and cream) or carbohydrate (e.g. sugar) is not necessary during the first year of life. This study also found that with the exception of DHA, goals for adequacy in energy, protein, carbohydrate and total fat are easily met by healthy infants who are breast-fed in conjunction with a nutritious diet of solid food. However, protein intakes are high and increase with age as the introduction of solid food progresses (124–594% of goal). Achievement of DHA intake goals are challenging and dependent on the specific inclusion of oily fish. Clear, practical and accessible public health information on these weaning issues is needed to guide all parents.

1. Metcalf NB & Monaghan P (2001) *Trends Ecol Evol* **16**, 254–260.
2. Koletzko B, von Kries R, Closa R *et al.* (2009) *Am J Clin Nutr* **89**, 1836–1845.
3. UK-WHO (2010) Available at: <http://www.rcpch.ac.uk/Research/UK-WHO-Growth-Charts>.
4. Institute of Medicine (2006) Washington DC: National Academies Press.
5. European Food Safety Authority (2010) *EFSA J* **8**, 1461.