

EARLY YEARS NUTRITION



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Children's nutrition has been in the news in the last few years, perhaps more than ever before. Alarmingly, for the first time, it is predicted that today's children may have shorter life expectancies than their parents (1) due to rising levels of obesity. In response to these concerns, the Government has introduced mandatory guidelines for school meals, restricted advertising of 'unhealthy' foods to children and are introducing front-of-pack labelling of foods to help consumers make good choices.

There is also some evidence that consumers are changing their eating behaviours; whole milk sales continue to decline and sales of fresh vegetables were increased in the last survey (2).

However, conversely, overall percentages of energy from fat, saturated fat and sugar remain above recommended levels and overall intakes of fruit and vegetables remain static, suggesting that families are not making major changes to their eating habits. The benefits of good nutrition as well as the possible risks of poor feeding practices are detailed below.

BREASTFEEDING

There are many very well recognised nutritional benefits to breastfeeding and health professionals should ensure that parents are aware of these including:

- gastroenteritis - several studies have shown a reduction in risk of diarrhoeal disease in breastfed infants (3,4);
- respiratory infection - rates of upper respiratory tract infection (URTI) are known to be lower in breast-

fed infants and this protection may be long-lasting; one study found a reduced risk of ever having had a respiratory infection in seven-year olds who had been breastfed as infants for at least 15 weeks (5);

- obesity - there is increasing evidence that breastfeeding helps to protect against obesity later in life (6,7);
- atopy - breast milk at least partially protects against atopic conditions such as eczema and asthma, particularly in infants with a positive family history (5,8,9);
- improved cognitive development - infants who have been breastfed are known to have higher IQ levels, although a recent study has disputed that this is actually an effect of breast milk (10);
- insulin dependent diabetes - several studies have shown a reduction in the incidence of childhood insulin-dependent diabetes in high risk families (11).

Breastfeeding is a skill learned by mother and baby and if we are serious about promoting breastfeeding, we have to ensure that support is available to help those skills to be attained. ►

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Table 1

Food Group	Foods	Portions (by one year)
Meat and alternatives	Lamb, beef, pork, chicken, turkey, fish, eggs, pulses (peas, beans, lentils, dhal), nuts	1-2 servings a day (2-3 servings for vegetarians)
Cereal foods	Breakfast cereals, bread products (including tea cakes, bagels, pitta bread, bread muffins, crumpets, malt bread etc), potatoes, rice, pasta, chapatti, plantain, yam	3-4 servings a day
Milk and dairy products	Milk, yoghurt, cheese, fromage frais, custard, cheese sauce etc	3 servings a day
Fruit and vegetables	All fresh, frozen, tinned and dried fruit and vegetables	5 tastes a day

WEANING

Government advice since May 2003 is that solids should not be introduced until around six months. Despite this, the optimal age of weaning onto solid foods continues to cause much controversy and debate (12). Fewtrell et al assert that, while exclusive breastfeeding for six months is 'readily defensible in resource poor countries with high morbidity and mortality from infections', in the West, any proposed beneficial effects of exclusive breastfeeding to six months would need to be weighed against potential adverse effects.

Studies carried out since 2001, point to a reduction in risk of infection for exclusive breastfeeding to six months in the West. However, they are only observational studies and may relate to introduction of formula rather than solids (13). Fewtrell et al suggest that there may be an optimum immunological 'window' to introduce solids - some studies have suggested that early and late (after six months) introduction of allergens may lead to increased risk of allergies and coeliac disease (14,15). This paper inevitably led to a furious response from those committed to six months exclusive breastfeeding; SACN (16) responded by saying that they stood by their recommendation for complementary foods to be introduced at 'about six months' and that this accounted for individual variation in timing of introduction of solids. Therefore, perhaps the emphasis should instead be on recognising that starting solids much too early (before four months) or much too late (after six months) is well recognised to cause problems.

Weaning too early may affect:

- immature organ systems, e.g. gut, kidneys (17);
- risk of atopy (17);
- risk of coeliac disease (17);
- risk of wheeze and respiratory illness (5);
- cardiovascular disease risk (5);
- obesity risk (5);
- nutritional adequacy of the diet (18).

Weaning too late may cause:

- nutritional deficiencies, such as iron, zinc and vitamin D (18);
- increased risk of atopy (14);
- missed 'window' for introducing new tastes and textures (19).

It is perhaps assumed that most parents know how to wean their infants. However, in a culture where food preparation plays a diminishing role, this can be a dangerous assumption. Parents from across the socioeconomic spectrum need to be educated about offering foods from all the food groups (see Table 1) and given practical ideas on food preparation to ensure that the ongoing nutritional needs of infants are met and that problems are minimised in the second year and beyond.

Good weaning practices can avoid most simple nutritional problems in the toddler years. However, many nutritional difficulties can develop and some of these are discussed below. ►

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Important Notice: Breastfeeding is best for babies. Breastmilk provides babies with the best source of nourishment. Infant formula milks and follow on milks are intended to be used when babies cannot be breastfed. The decision to discontinue breastfeeding may be difficult to reverse and the introduction of partial bottle feeding may reduce breastmilk supply. The financial benefits of breastfeeding should be considered before bottle feeding is initiated. Failure to follow preparation instructions carefully may be harmful to a baby's health. Infant formula and follow on milks should be used only on the advice of a healthcare professional. *HiPP Organic First infant milk £1.00 per 100ml. Aptamil First infant milk £1.05 per 100ml. Prices correct as of May 2013 in Sainsbury's online.

VITAMIN D DEFICIENCY

This was seen as a problem caused by the Industrial Revolution and the rise of slum dwelling; children did not have adequate access to sunlight and so developed rickets. Provision of cod liver oil and orange juice - and then later vitamin drops - to children under five, saw the virtual eradication of rickets after World War II in the United Kingdom. However, in recent decades, there has been a resurgence of rickets, seen particularly in infants from ethnic groups with dark skins, particularly in those from Asia, but also in those from the Middle East, Africa and the Caribbean (20). In addition, there is emerging evidence linking vitamin D deficiency to mortality and morbidity, including all cause mortality (21), bowel and other cancers (22), cardiovascular disease (23,24), multiple sclerosis (25), Type 1 and Type 2 diabetes (26,27), tuberculosis (28) and recently a relationship has been described between vitamin D deficiency and anaemia in childhood (29).

The most recent Nutrition and Diet Nutrition Survey (30) revealed low serum levels of vitamin D in the UK population, particularly in those living north of Birmingham. In view of the increasing concerns regarding the implications of poor vitamin D status, the Chief Medical Officers of the UK released a statement in 2012 (31) restating the importance of vitamin D, particularly in vulnerable groups, including children under five. Therefore, it is important that mothers are encouraged to take vitamin D supplements during pregnancy and that infants and young children from six months to five years, taking less than 500mls infant formula per day are given vitamin D supplements; for those on low incomes these are available through the Healthy Start scheme.

IRON DEFICIENCY ANAEMIA

At least one in eight toddlers is anaemic by the time they reach their second year and this rises to 40 percent in some deprived communities (32). Iron deficiency anaemia can cause:

- poor appetite
- poor growth
- developmental delay
- reduced resistance to infection

High iron foods should be given to babies and toddlers every day; meat is the best source,

but iron fortified breakfast cereals and infant formulas are also important sources of iron in infant and toddler diets. Iron deficiency anaemia is particularly common in Asian communities, where weaning is often delayed, cows' milk is more often started early and there can be overdependence on baby puddings; particularly as savoury jars may not be suitable for religious reasons.

FALTERING GROWTH

About one in five infants and young children will have an episode of faltering growth in the early years (33); that is, they won't meet expected rates of growth according to growth chart norms almost always because of under-nutrition. This will rarely be due to disease, but is more commonly due to poor eating and feeding behaviours - in the child and family. Advice from the Health Visitor will correct the situation in most cases, but more complex cases may need input from a dietitian or multidisciplinary feeding team. Assessment will include:

- feeding history
- medical history
- growth history
- current food intake - meals, snacks drinks etc
- pattern of food intake - grazing, just meals, meals and snacks etc
- environment of food intake, e.g. at the table, on the move, family meals etc

Advice will focus on improving calorie intake by improving food choices, but also assessing and changing, where necessary, the child and family's behaviours and attitudes around food provision and mealtimes. Providing food regularly, but not allowing grazing or constant sipping at drinks is important, as well as trying to move towards more relaxed, social mealtimes.

OBESITY

Over recent years there have been sharp increases in rates of childhood obesity (34). It was predicted that by 2010 over 1.5 million under 16s would be obese (35). Even during childhood, obesity is linked with problems such as Type 2 diabetes, high blood pressure, high cholesterol, orthopaedic problems and ▶

exacerbation of asthma. Additionally, overweight children tend to suffer from higher rates of low self esteem and bullying (36,37). If trends are to be reversed, families need to make good nutrition a priority for the whole family. Parents need to be encouraged to provide their children with regular meals and nutritious snacks, rich in fruit and vegetables and complex (starchy) carbohydrates; snacks such as crisps, biscuits, cakes and sweets should form a small, not regular, part of their diet. Children should also be encouraged to

be physically active (i.e. play) for large parts of the day rather than being allowed to sit in front of the television and computer.

Finally, families should be encouraged to cook, eat and enjoy food together as often as they can, which in itself has been shown to have nutritional benefits (38). Food is an important part of all our lives; for the sake of the next generation it is imperative that the quality of the food we feed our children is given higher priority even in the midst of busy 21st century lives.

References

- 1 Olshansky SJ et al (2005). A potential decline in life expectancy in the United States in the 21st century. *N Engl J Med.* 352, 1138-45
- 2 Defra (2006). *Family Food in 2004-5*
- 3 Howie PW, Forsyth JS, Ogston SA et al (1990). Protective effect of breastfeeding against infection. *BMJ* 300, 11-16
- 4 Kramer MS, Chalmers B, Hodnett ED et al (2001). Promotion of breastfeeding intervention trial (PROBIT). A randomised trial in the republic of Belarus. *JAMA* 285, 413-20
- 5 Wilson AC, Forsyth JS, Greene SA et al (1998). Relation of infant diet to childhood health: seven-year follow up of cohort in children in Dundee infant feeding study. *BMJ* 316, 21-5
- 6 Armstrong J, Reilly J (2002). Breastfeeding and lowering the risk of childhood obesity. *Lancet* 359, 2003-4
- 7 von Kries R, Koletzko B, Sauerwald T et al (1999). Breastfeeding and obesity: cross sectional study. *BMJ* 319, 147-50
- 8 Saarinen UM, Kajosaari M (1995). Breastfeeding as prophylaxis against atopic disease: prospective follow-up study until 17 years old. *Lancet* 346, 1065-9
- 9 van Ojik J, Kull I, Borres MP et al (2003). Breastfeeding and allergic disease: a multidisciplinary review of the literature (1966-2001) on the mode of early feeding and its impact on later atopic manifestations. *Allergy* 58, 833-43
- 10 Der, G et al (2006). Effect of breastfeeding on intelligence in children: prospective study, sibling pairs analysis and meta-analysis. *BMJ.* 333 (7575), 945
- 11 Visalli N, Sebastini L, Adorisio E (2003). Environmental risk factors for Type 1 diabetes in Rome and province. *Arch Dis Child* 88, 695-8
- 12 Fewtrell M, Wilson D, Parsons L (2011). Six months of exclusive breastfeeding: how good is the evidence? *BMJ* 2011; 342:c5955
- 13 Quigley MA, Kelly YJ, Sacker A (2009). Infant feeding, solid foods and hospitalisation in the first eight months after birth. *Arch. Dis. Child* 94, 148-150
- 14 Prescott SL, et al. (2008). The importance of early complementary feeding in the development of oral tolerance: concerns and controversies. *Pediatr Allergy Immunol* 19, 375-80
- 15 Norris JM, et al (2005). Risk of coeliac disease autoimmunity and timing of gluten introduction in the diet of infants at increased risk of disease. *JAMA* 293, 2343-51
- 16 Williams AF, Prentice A (2011). Scientific Advisory Committee on Nutrition replies to Mary Fewtrell and colleagues. *BMJ* 342 doi: <http://dx.doi.org/10.1136>
- 17 Committee on Medical Aspects of Food Policy (COMA) (1994). *Weaning and the Weaning Diet.* HMSO: London
- 18 Stordy BJ, Redfern AM, Morgan JB (1995). Healthy eating for infants - mothers' actions. *Acta Paediatr* 84, 733-741
- 19 Northstone K, Emmett P, Nethersole F and the ALSPAC study team (2001). The effect of age of introduction to lumpy solids on foods eaten and reported feeding difficulties at six and 15 months. *J Hum Nutr Diet* 14, 43-54
- 20 Callaghan AL et al (2006). Incidence of symptomatic vitamin D deficiency. *Arch Dis Child.* 91(7): 606-607
- 21 Gioannucci E. Can vitamin D reduce total mortality? *Arch Internal Med.* 2007. 167: p1709-10
- 22 Lappe JM et al. Vitamin D and calcium supplementation reduces cancer risk: results of a randomised trial. *Am J Clin Nutr.* 2007. 85 (6): p1586-91
- 23 Wang T et al. Vitamin D deficiency and risk of cardiovascular disease. *Circulation.* 2008. 117: p503-511
- 24 Artaza JN, Mehrotra R, Norris KC. Vitamin D and the cardiovascular system. *Clinical Journal of The American Society of Nephrology.* 2009. *CJASN*, 4, (9) 1515-1522
- 25 Ramagopalan SV, Mauger NJ, Handunnethi L, Lincoln MR, Orton S-M et al. Expression of the Multiple Sclerosis-Associated MHC Class II Allele HLA-DRB1*1501 Is Regulated by Vitamin D. *PLoS Genet.* 2009. 5 (2): e1000369. doi: 10.1371/journal.pgen.1000369
- 26 Zippiti, C, Akobeng A. Vitamin D supplementation in early childhood and risk of Type 1 diabetes: a systematic review and meta-analysis. *Arch. Dis Child.* 2007 doi:10.1136/adc.2007.128579
- 27 Pittas AG et al. The role of vitamin D and calcium in Type 2 diabetes. A systematic review and meta-analysis. *J Clin Endocrinol Metab.* 2007. 92 (6): p2017-29
- 28 Nnoaham K, Clarke A. Low serum vitamin D levels and tuberculosis: a systematic review and meta-analysis. *International Journal of Epidemiology.* 2008. 37 (1): p113-9
- 29 Atkinson MA et al (2013). Vitamin D, Race, and Risk for Anaemia in Children. *J Pediatr (Online)* doi: 10.1016/j.jpeds.2013.08.06
- 30 DH, FSA (2012). *National Diet and Nutrition Survey. Headline results from Years 1, 2 and 3 (combined) of the Rolling Programme (2008/2009-2010/11)* www.natcen.ac.uk/media/978078/ndns-y3-report_all-text-docs-combined.pdf
- 31 DH (2012). *Vitamin D - advice on supplements for at-risk groups.* Letter from Chief Medical Officers of the UK www.gov.uk/government/uploads/system/uploads/attachment_data/file/213703/dh_132508.pdf
- 32 Booth IW, Auckett MA (1997). Iron deficiency anaemia in infancy and early childhood. *Arch Dis Child* 76, 549-54
- 33 Blair PS et al (2004). Family, socioeconomic and prenatal factors associated with failure to thrive in the Avon Longitudinal Study of parents and children (ALSPAC). *Int J Epidemiol* 33, 839-47
- 34 Jotangia D et al (2005). Obesity among children under 11. Department of Health
- 35 Zaninotto P et al (2006). Forecasting obesity until 2010. Department of Health
- 36 RCPCH et al (2004). Storing up problems: the medical case for a slimmer nation
- 37 SIGN (2003). SIGN guideline No.69: Management of obesity in children and young people: a clinical guideline. www.sign.ac.uk
- 38 Gillman MW et al (2000). Family dinner and diet quality among older children and adolescents. *Arch Family Med* 9, 235-40

Questions relating to: *Early Years Nutrition*

Type your answers below and then **print for your records** or print and complete answers by hand.

Q.1 Describe the concerns that have led to the government issuing mandatory guidelines for school meals.

A

Q.2 Describe at least four health benefits of breastfeeding.

A

Q.3 What is the current UK government advice on infant weaning?

A

Q.4 Describe the risks of weaning too late.

A

Q.5 Why is there an increasing vitamin D deficiency in children in this country?

A

Q.6 Describe the health problems associated with iron deficiency anaemia.

A

Q.7 Define faltering growth and its causes.

A

Q.8 To ascertain if faltering growth is due to poor eating and feeding behaviour, what are the six key areas of an assessment?

A

Q.9 How can parents help in the fight against childhood obesity?

A

Please type additional notes here . . .