

Toddler nutrition: meeting nutritional needs and establishing good habits

Good nutrition during the toddler years is essential to support this important period of physical, cognitive and social development, writes **Jessica Schram**

BABIES grow at a lightning pace, tripling their birth weight and growing by an average of 25cm in length in the first year of life. From one to three years, this slows to just 8-12cm per year and an average weight gain of two to three kilos each year. While growth slows down somewhat during the toddler years, good nutrition remains essential to support this time of huge physical, cognitive and psychological development.

Early childhood is the most intensive period of brain development during the lifespan. During the first three years of life, an infant's brain has grown from 25% of its approximate adult size at birth to 80% of its final adult size. In order to support brain development, good nutrition is essential. Inadequate brain growth due to malnutrition can result in lasting behavioural and cognitive deficits, including slower language and fine motor development and later, lower IQ and poorer school performance. An adequate iron intake, in particular, is critical for maintaining sufficient oxygen-carrying red blood cells which are necessary to support brain growth. Iron deficiency, most often caused by poor nutrition in this age group, has been clearly linked to cognitive deficits in young children.

Poor nutrition in toddlers can also lead to other nutritional deficiencies such as vitamin D deficiency which is detrimental to bone health, as well as other nutritional problems such as faltering growth, childhood obesity and constipation. Furthermore, research has shown that good nutrition during the early childhood years can have a lasting impact on lifelong physical health, reducing a child's risk of developing obesity, coronary heart disease, hypertension, type 2 diabetes and cancer in adult life.

Obesity

Childhood obesity is a growing problem in Ireland, with one in four children considered overweight or obese.¹ Poor nutrition is one of the leading causes of obesity in childhood, a condition which is associated with a range of health risks including an increased risk of early onset type 2 diabetes, hypertension, asthma, musculoskeletal disorders, as well as psychological problems such as low self esteem and depression.

As well as the increased risk of poor health in childhood, a major concern is that obese children will become obese adults. Childhood obesity results in almost one-third of adult obesity, and adults who were obese in childhood are more likely to be severely obese² which is associated with an increased risk of morbidity and premature mortality. It has been suggested that there are certain critical periods in childhood during which the development of obesity is associated with an increased risk of persistent obesity and its complications.

Early infancy is one of these critical periods. BMI increases in the first year of life, decreases and then increases again at about five years of age. This is known as the period of adiposity rebound. Studies have found that children whose adiposity

rebound begins early, ie. in the toddler years, have a higher BMI in adolescence and adult life than other children.

Iron deficiency

Poor nutrition can also lead to iron deficiency.³ Young children have been identified as a group at high risk for developing iron deficiency because of their high iron requirements to support rapid growth.

A healthy full-term baby is born with about 75mg iron/kg body weight endowed by the mother. A baby's iron needs cannot be met by breast milk or formula alone and the endowed iron stores are used to meet requirements. Iron stores become depleted by four to six months of age, at which point the infant becomes fully dependent on external iron sources. Therefore, to avoid iron deficiency, iron rich foods should be included early in the weaning process and throughout early childhood.

Iron in the diet is present as haem-iron in meat, fish and poultry, and as non-haem iron in vegetable foods; the latter requires vitamin C to enhance its absorption. Results from the recent National Preschool Nutrition Survey suggest that 23% of one-year-olds, 10% of two-year-olds and 11% of three-year-olds have inadequate iron intakes.⁴ Iron deficiency has been linked to impaired cognitive performance and motor development, and growth retardation which may not be fully reversible when the deficiency is corrected.

Toddlers' nutritional needs

Toddlers aged between one and three years have high nutritional requirements relative to their size as they are still undergoing rapid growth and development, and are usually very active. Toddlers need between 1,000 and 1,400 calories a day depending on their age, size, and physical activity level. Their small stomach limits their capacity to eat large portions at meal-times. Therefore, snacks are important and priority needs to be given to energy dense and non-bulky nutritious foods such as red meat, fish, poultry and dairy products. A toddler's diet should consist of three small nutritious meals and two to three healthy snacks daily. For children under two years of age, high-fibre low-fat diets are generally not recommended as adequate fat and calories are needed for growth and development at this age.

To achieve nutritional requirements toddlers should be given foods from each of the four main food groups every day:

- Cereals, breads and potatoes
- Fruit and vegetables
- Milk and other dairy products
- Meat, fish, eggs, beans, and pulses.

The number of recommended servings from each group and the key nutrients they provide are shown in *Table 1*. The greater the variety of foods eaten within each food group, the better the

Table 1

balance of nutrients provided. Commercial baby foods have lower nutrient content than homemade meals and should be discouraged. Remember that an average serving size for a toddler should be approximately one-quarter to one-third the size of an adult portion.

Water and milk are the only suitable drinks for children, and toddlers should be consuming approximately one pint (17-20oz) of regular cow's milk daily (low fat milk is suitable over two years of age).

Unsuitable foods for toddlers

- Juices and high sugar foods such as chocolate, muffins, croissants, and sweets which provide 'empty calories', ie. calories but no nutrients, have no place in toddlers' diets as they are filling and can displace a child's appetite for nutritious foods. In addition, such foods can contribute to excess weight gain, tooth decay and promote a liking for sweet foods. This also applies to 'no added sugar' and 'sugar-free' juices
- High salt foods such as crisps, commercial sauces and processed meats (sausages, ham, bacon), and the addition of extra salt to an infant's diet should be avoided. A high salt intake in childhood may be linked with high blood pressure in later life
- Whole or chopped nuts should not be given to children under the age of five years due to the risk of choking
- Tea (any type) should not be given to toddlers as it contains caffeine and tannins which reduce the absorption of important micro nutrients such as iron.

Start early

An important goal of early childhood nutrition is to optimise children's present and future health by fostering the development of healthy eating behaviours. Research has shown that eating habits learned in childhood continue throughout the lifespan. Therefore, if we can instil healthy eating habits from the beginning, we can help towards ensuring that healthy eating habits continue throughout childhood and into adult life. Babies are born with an innate preference for sweet foods and a liking for any other flavour needs to be learned. Exposing children to a wide range of different healthy foods during weaning and the early toddler years is essential to helping them accept a wide variety of different tastes.

During the toddler years, the rate of growth slows down which may be reflected in a less reliable appetite. Parental concerns about distractibility at mealtimes, or the limited variety of foods accepted are not uncommon. Parents should be reassured that it is perfectly normal for healthy toddlers to eat well some days, and eat less on other days. Parents are responsible for providing a variety of nutritious foods, defining the structure and timing of meals, and creating a mealtime environment that facilitates eating and social exchange. Children are responsible for determining how much is eaten at each meal. Parents should trust in their child's internal hunger and satiety mechanism and trust that their child will eat at the next meal time if hungry.

Showing independence is also a normal part of toddler development and this often manifests in food refusal or fussy eating which is usually a passing phase but can potentially lead to an inadequate intake of certain nutrients if a prolonged issue. Strategies to manage fussy eating include:

Repeated exposure

Studies show that it can take up to 15 occasions of tasting a particular food for a child to start liking a food. Therefore even if a food is rejected on the first few tastings, patience, persistence and

Recommended toddler nutrition		
Food groups	Main nutrients provided	Recommended servings per day
Bread, potatoes and other cereals	Carbohydrate B vitamins Fibre Some iron Calcium Zinc	Aim for four servings Serve at each meal and some snacks
Fruit and vegetables	Vitamin C Carotene Fibre Some iron	Two to four servings
Milk and dairy	Calcium Protein Vitamin B2 and B12	Three servings
Meat, fish and alternatives	Protein Iron B vitamins Zinc Omega 3 fatty acids	Two servings

repeated exposure is likely to lead to eventual acceptance

Parental role modelling

Infants learn by watching others and mimicking their behaviour. Shared family mealtimes are an ideal opportunity for parents to model healthy eating behaviours.

Positive parent-child feeding style

Force feeding is never recommended. A stressful feeding experience will not produce a positive result. Toddlers should be encouraged to try new foods and praised when they eat well but negative behaviours should receive minimal attention.

Stick to routine

Throughout the "fussy eating" phase, continue to offer only healthy nutritious foods and regular meals and snacks. If family meals are refused avoid offering alternative drinks or foods which the child may prefer. If this approach is used consistently by all caregivers the toddler will soon learn to eat foods offered at mealtimes.

Good nutrition during the toddler years is essential to support this important period of physical, cognitive, and social development. In addition, establishing healthy eating habits early in childhood can have a significant positive impact on health throughout a person's life. Parents can foster healthy eating habits in toddlers by establishing a regular meal and snack routine, and by offering small portions of nutritious foods at meal and snack times.

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References

1. Growing Up in Ireland (2011) National Longitudinal Study of Children. Overweight and Obesity among 9-year-olds. Dublin: Government Publications Office
2. Dietz WH. (1994) Critical periods in childhood for the development of obesity. *Am J Clin Nutr*; 59: 955-959
3. World Health Organisation. Worldwide Prevalence of Anaemia 1993-2005. Geneva: WHO Press, 2008
4. Irish Universities Nutrition Alliance. National Pre-School Nutrition Survey, Summary Report on: Food and Nutrient Intakes, Physical Measurements and barriers to healthy eating. 2012. Available at: http://www.iuna.net/wp-content/uploads/2012/06/Summary_Report_National_PreSchool_Nutrition_Survey_June_2012.pdf