FEEDING CHILDREN: 1 TO 3 YEARS

The information explosion in the science of nutrition very often creates the impression that available information is contradictory. Consequently, it is no longer easy to distinguish between fact, misinformation and fiction. The Division of Human Nutrition, Faculty of Medicine and Health Sciences, Stellenbosch University act as a reliable and independent source of nutrition information.

This is the age where the eating habits for later life are established and it is therefore important that a positive attitude towards food is formed and sound eating habits are developed.

At the age of one year the child should have been introduced to a variety of (healthy) foods. The child can now start receiving meals suitable for adults, with only slight adaptations. It is therefore no longer necessary to prepare separate meals for the toddler. Care should, however, be taken not to prepare heavily spiced or fried foods.

The child's diet should contain a suitable balance of nutritious foods, including fruit, vegetables, whole and enriched grains and cereals, milk and other dairy products, meat, fish, poultry and other protein sources.
The amount of food the child requires depends on a variety of factors including gender, size and activity. The rate of growth at this age is slower than in the first year of life and this is associated with a decrease in appetite, which may further fluctuate on a daily basis. The change in the rate of growth is best illustrated by the birth weight which trebles in the first year of life and thereafter it takes another year before it is quadrupled. There is generally a greater rate of increase in height than weight, transforming the chubby toddler into a leaner child. It should be kept in mind that young children can only manage a small amount of food at a time. It is recommended for the child to receive 5 to 6 smaller meals daily. These include mid-morning, mid-afternoon and bedtime snacks. A general rule that can be followed is to offer a minimum of one tablespoon of each food for every year of age and thereafter to offer more food according to appetite. Snacks should be planned so that the child does not continuously snack. They should therefore be spaced to ensure that the child is hungry at meals and the interval between meals and snacks should be tailored to meet the child's hunger and satiety cues.

Suitable snacks and beverages:
Yoghurt
Fresh/dried fruit
Raw vegetables e.g. carrot sticks, cucumber cubes, cherry tomatoes with dips
Pasta or potato salad
Pieces of cheese
Sandwiches with suitable fillings e.g. peanut butter, tuna, cheese, fish paste
Unsweetened fruit juice (avoid using excessive amounts)
Fruit shake (Milk blended with fresh fruit)
Frozen fruit cubes (Frozen pureed fruit or fruit juice)
Homemade soup

Children need to eat a good variety of foods, which will supply around 1300kcal and at least 16g protein per day. In this age group, with their relatively high-energy requirements, it is not necessary to restrict fat and cholesterol, although grilled and baked foods always remain preferable to fried and fatty foods. If the child is eating large amounts of fast food or junk food, it is

likely that the dietary fat intake is too high. Conversely, care should be taken in order to ensure that parents who are aware of the association between diet the development of degenerative disease later in life, do not apply their adult dietary recommendations to this age group. There are documented cases where toddlers showed poor weight gain and loose stools due to a diet low in fat and high in fibre. Restriction of fat is not recommended before the age of 2 years due to this age group's high energy needs and essential fatty acid requirements and the importance of fat on central nervous system development. The suggested distribution of energy is: 50 – 60% carbohydrates, 30 – 35% fat and 10 – 15% protein.

Feeding Guide for Children 1 – 3 years

Food Group	Number of servings / day	Serving sizes
Dairy products Milk or yoghurt Cheese	3 - 4	 ½ - ¾ cup 15 – 20g
Meat, fish, poultry, legumes Lean meat, fish, poultry Cooked legumes	2 or more	 30 – 45g ¼ cup
Vegetables	3 or more	1 – 3 tablespoons
Fruit	2 or more	¼ - 1 fruit
Breads, cereals, rice, pasta, porridge Bread Cereal Pasta, rice, porridge	4 or more to satisfy the child's appetite	 ½ - 1 slice ½ - ¾ cup ½ cup
Butter, margarine, oil	20 – 25ml per day depending on activity	
Sugar, jam, syrup	Just enough to make food tasty	

Micronutrient Supplementation

Micronutrient supplementation in children, as with adults, is a hotly debated subject. A micronutrient supplement is generally not required provided the child eats well and the diet is adequate in energy and protein. Should a supplement be given, the choice should be for a complete supplement, since some supplements consumed often do not provide certain micronutrients that the child is at risk of having an inadequate intake e.g. iron and calcium. The children who particularly may benefit from micronutrient supplementation are those: a) from deprived families, b) with poor eating habits and poor appetites, c) chronic diseases e.g. cystic fibrosis, d) on strict vegetarian diets, e) obese children on weight management programs.

Hints for Healthy Eating:

Children learn by example. Set a good example by eating the same healthy dishes and also sharing mealtimes.
Discourage snacking on foods with poor nutrient density e.g. crisps, chocolates, sweets etc. Keep a good supply of healthy foods e.g. fruit, yoghurt, which can be eaten between meals.
Minimise temptation by avoiding keeping foods with poor nutrient density e.g. chips, biscuits etc in the house.
Aim at 5 portions fruit and vegetables per day. Give a variety of fruit and vegetables from an early age.
Try to avoid adding unnecessary sugar to drinks and foods.
Avoid sprinkling extra salt over food to avoid conditioning children to salty foods.

Milk intake

If the child is still being breast-fed at this age, maintenance of breast-feeding should be encouraged for as long as possible, preferably up to the age of two years. In most cases however, at the age of one year full cream cow's milk may be introduced. Low fat cow's milk should only be introduced at the age of two years in overweight children and at the age of five years in normal children. Milk remains an important source of energy and essential fatty acids high biological value

proteins and calcium. The intake of milk should, however, be limited to approximately 600ml per day. Excessive amounts of milk could lead to poor intake of solid food. Cow's milk is a poor source of certain minerals such as iron. An excessive intake of cow's milk together with a poor intake of solids could lead to iron deficiency anaemia.

COMMON CHILDHOOD NUTRITIONAL PROBLEMS

Refusal to eat

The children in this age group are characterised by their curiosity and desire for independence, which includes manipulation of their environment. It is therefore to be expected that toddlers go through phases of reluctance and refusal to eat. This may be part of a manipulative strategy or may be due to a greater interest in the world around them. Alternatively a minor illness may play a causal part in the refusal to eat. This, in the absence of chronic conditions e.g. asthma, cystic fibrosis, congenital heart disease etc, generally resolves itself.

In most children the growth is steady and slow, but it may be erratic in some children. Some children may have reduced growth patterns for several months to be followed by a growth spurt. It is intriguing that these growth patterns tend to mirror the patterns of appetite and food intake. These episodes of poor intake may be of great concern for most parents and this may lead to mealtime battles.

In many cases the child's intake at each meal tends to vary considerably, but the total energy intake at the end of the day remains comparatively constant. In spite of apparent poor intake, especially when compared with the first year of life, most children achieve and sustain normal growth and appear healthy and active. It may be helpful for the parents who are concerned with their child's intake, to plot serial weights and heights on a growth chart (Road-to-Health Card) to reassure them that their child's growth is normal.

Mealtime battles remain a reality in many households with children in this age group. In the absence of a minor illness or chronic disorder, it is important to listen to the concerns of the parents and to allay their fears.

Hints that could be followed include:

- Avoid force-feeding and excessive coaxing. These struggles are fruitless and this will most likely lead to a life-long aversion to certain foods.
- Make food fun. Allow the child to help with simple tasks e.g. measuring or stirring while preparing food
- Ensure relaxed mealtimes. Serve food at the table in an atmosphere conducive to eating.
- Serve appropriately spaced meals. The child shouldn't be too tired before meals, or in-between snacks given too close (within 1½ hours) to the main meals.
- Offer a variety of foods, including favourites. Give new foods at the beginning of the meal while the child is hungry. No fuss should be made if the new item is rejected. That new item can be re-introduced a few days later, perhaps prepared differently or mixed with a favourite food. It is also not unusual for children to suddenly reject previously favourite foods.
- Avoid using favourite foods as reward for eating e.g. promising pudding if all the vegetables are eaten. This will not make the vegetable more popular and is liable to lead to manipulation and a negative attitude to that food item. If a reward is to be used at all, it is better to use a non-food items, e.g. a story, games, favourite TV program etc.
- Allow sufficient time for the toddler to complete the meal. In particularly difficult eaters it may be necessary though to set a time limit (around 20 minutes) in which the meal should be completed. Attempts at attention seeking, refusals and undesirable behaviour should be ignored.
- Consensus should be achieved between family members e.g. parents, grandparents and caregivers, how the difficult eater will be handled.
- Allow the child to feed him or her-self. It is to be expected that mealtimes will be messy, but this should be tolerated to allow the child to acquire the necessary feeding skills.
- Children usually prefer that individual food items do not touch each other on the plate. Casseroles and mixed dishes, except pizza and spaghetti, are usually not popular. They favour

bright colours and smooth or crunchy textures instead of soggy vegetables or lumpy mash potatoes.

Toddler Diarrhoea

Toddler diarrhoea is the frequent passage of stools (often more than three times daily), usually containing recognisable, undigested food. Toddler diarrhoea usually develops between 6 and 20 months of age and, in most cases resolves itself spontaneously by the third year of life. There is usually no detrimental effect on growth or weight gain and extensive investigations, except possibly stool cultures and stool reducing substances, are unnecessary. Parents need to be reassured that this is a benign and self-limiting condition. Dietary advice could include the decrease the intake of fruit juices particularly apple juice and to decrease difficult-to-digest cooked and raw vegetables e.g. corn and peas. Other dietary adaptations, which could be considered, include increasing the fat intake to slow intestinal motility and to delay gastric emptying and increasing fibre intake to firm the stools. In some children, however, increasing the fibre intake could increase the diarrhoea. Toilet training may also help alleviate the problem.

Probiotics have been shown to be beneficial in children with diarrhoea. More specifically, *Lactobacillus rhamnosus GG* has been consistently shown to reduce the duration of acute infantile diarrhoea, often the result of a rotavirus infection, by about 50%. This strain has also been useful as a prophylaxis of diarrhoea in undernourished children. The underlying mechanisms for the beneficial effect are thought to include the stimulation of the immune response and/or the enhancement of the gut mucosal integrity. Additionally, *Bifidobacterium bifidum*, given in conjunction with *Streptococcus thermophilus* in a standard milk formula, has been shown to reduce the incidence of rotaviral diarrhoea. Other studies in children with gastroenteritis who received a probiotic supplement (either *Lactobacillus rhamnosus*, *Lactobacillus reuteri* or *Lactobacillus casei*) have also shown a significant decrease in the duration of diarrhoea in these children.
In the developing world of course, diarrhoea is one of the leading causes of child morbidity and mortality and although probiotics are thought to have an important role to play in its prevention, their value must be more extensively confirmed.

In summary, children in this age group acquire knowledge and assimilate concepts in leaps and bounds. This is the ideal time to provide nutrition information and to promote positive attitudes about all foods. This learning should be informal and natural, preferably “hands-on” in the home. The parents can provide the healthy food options, while the child can control the portion sizes.

For further, personalized and more detailed information, please contact a dietitian registered with the Health Professions Council of South Africa.

References from the scientific literature used to compile this document are available on request.

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