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## Changing behaviour: Childhood nutrition

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### The current problem

Recommendations for good nutrition change across the lifespan. Current recommendations state clearly that breast milk is the best possible food for all babies up until six months old when weaning onto a wide variety of tastes and textures can start. As babies turn into toddlers they suddenly become much more active and their need for energy increases dramatically. During this time they need a diet high in complex carbohydrates with moderate amounts of meat and fish and relatively low in fat and sugary foods. They also need lots of dairy products for their calcium levels. Between ages two to five children should be eating a balanced diet high in complex carbohydrates and fruit and vegetables with a moderate amount of protein and low in fat and sugary foods. They shouldn't be on a low fat diet as such and should now be drinking full fat milk and plenty of cheese for their fat and calcium intake. But neither should they be eating lots of high fat foods such as crisps and deep fried chips. Then by age five and over recommendations for children and adults are the same and their diets should be relatively low in fat, and sugary foods such as sweets, cakes and biscuits should only make up a small part of what they eat. In addition, their salt intake should be low and they shouldn't drink any alcohol (BNF, 2017). It is also increasingly clear that eating well is not just about what is eaten but also where, when and why food is consumed with an emphasis on three meals a day and the importance of breakfast, eating meals not snacks, eating at a table rather than 'on the go' and trying to eat for hunger rather than emotional reasons (Ogden, 2016).



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Children's diets are important as not only does a healthy diet help them grow and develop, but it can also relate to childhood illnesses including diabetes, obesity and asthma. Obese children may also show psychological problems with many showing body dissatisfaction, low self esteem, anxiety, low mood and a general lack of confidence and they are more likely to be bullied than thin children which can lead to under achievement or missing school (Foresight, 2007). In addition, what they learn to eat in childhood will have a huge influence on what they eat once they are adults and once adults their diet may cause or protect them from a wide range of illnesses such as obesity, coronary heart disease, cancer, diabetes and gall stones. Yet we know that the diets of children and young adults are often poor and particularly low in fruit and vegetables and too high in fat and salt. For example, surveys in the UK show that 75 per cent of children aged 10 to 11 exceed the recommended level for fat and that the majority of 9- to 11-year-old British children consume less than half the recommended daily intake of fruit and vegetables with only 5 per cent of children eating more (Foresight, 2007). Research also shows that whilst children's diets tend to be acceptable for protein levels they are often too high in sugar (mostly from fizzy drinks), too high in salt and lacking in vitamin A, vitamin D, and iron (causing high levels of anaemia). Further, about 20 per cent of this excess fat intake comes from snacks.

## Causes of the problem

The cause of poor diets in children is multifactorial but can be conceptualised in terms of biology, the role of the environment and the impact of psychological issues including the development of unhealthy beliefs about food and food preferences from an early stage (Ogden, 2010).

### Biology

Eating is a basic biological requirement and without food and drink we would die. We therefore tend to believe that we have innate preferences for foods and that we like certain foods because our ancestors did. To test this theory newborn babies have been given differently flavoured milk and their preference has been assessed using facial expressions and the speed of their sucking behaviour. The results show that newborn babies innately prefer sweet and salty tastes and reject bitter ones (Desor et al., 1973). Evolutionary speaking it is believed that a preference for sweet foods comes from the need to consume berries and fruits; that the preference for salty foods reflects the need for fish and meat and the dislike of bitter tastes protects us against poisonous foods and those which have gone mouldy (Kalat & Rozin, 1973). But, those babies who have been given sweetened milk in the first week of the study show an even greater preference for more sweetened milk the week after indicating that even at such a young age babies are learning what to like based upon what they are being given; the sweeter the milk they are familiar with the sweeter they like it. It seems that even the apparently innate preference for sweet tastes can be modified by familiarity. Accordingly, although there may be some biological basis for food preferences this is very quickly shaped through learning.

### The wider environment

Children's diets are clearly a response to the wider environment that we live in which has been labelled an 'obesogenic environment' (Hill & Peters, 1998). For example researchers have highlighted the impact of the food industry with its food advertising, food labelling and the location of high energy foods at key points of access (hot spots) in supermarkets. They have also identified the easy availability of energy-dense foods such as fast foods and takeaways, the impact of increasing portion

sizes, larger plates and pricing strategies such as ‘grab bags’, ‘buy one get one free’ and ‘meal deals’ all designed to encourage over consumption through mindless eating and the cheapness of prepared foods which discourage food shopping and cooking (Wansink, 2004). Accordingly, this obesogenic environment creates a world in which it is easy to consume an unhealthy diet leading to health problems including obesity and diabetes.

## The home environment

Children’s food preferences are also influenced by their more immediate environment – the home environment. This home environment functions in the same way as the wider environment by increasing access to unhealthy high calorie or high fat foods which have been brought into the home by parents. It also provides a context for parents to manage what and when their children eat and much research has explored the impact of parental control on children’s food preferences. Birch (1999) concluded from her review of parental control that ‘child feeding strategies that restrict children’s access to snack foods actually make the restricted foods more attractive’ (1999, p.11). Some studies, however, indicate that parental control may actually improve eating behaviour. For example, Wardle et al. (2002, p.453) suggested that ‘lack of control of food intake [rather than higher control] might contribute to the emergence of differences in weight’ and Brown and Ogden (2004) reported that greater parental control was associated with higher intakes of healthy snack foods. These conflicting results may be due to the ways in which control is operationalised. Ogden, Reynolds et al. (2006) explored this possibility and examined the effect of differentiating between ‘overt control’ which can be detected by the child (e.g. being firm about how much your child should eat) and ‘covert control’ which cannot be detected by the child (e.g. not buying unhealthy foods and bringing them into the house). The results showed that these different forms of control differently predicted snack food intake and that, while higher covert control was related to decreased intake of unhealthy snacks, higher overt control predicted an increased intake of healthy snacks. Similar results were also found in another sample of parents with small children (Brown et al., 2008). Furthermore, a longitudinal study by Jarman et al. (2015) indicated that increased use of covert control over two years was associated with an increase in healthy eating. Therefore, controlling the child’s environment may encourage healthy eating without having the rebound effect of more obvious forms of control.

## Individual beliefs and behaviours

A child’s diet is therefore influenced by their biology, the wider environment and their home environment. It is also a product of their own beliefs and food preferences and those of their parents. These can be understood drawing upon a developmental model of eating behaviour with its emphasis on exposure, social learning and associative learning (Birch, 1999).

The role of exposure simply describes the impact of familiarity on food preferences. Human beings need to consume a variety of foods in order to have a balanced diet and yet show fear and avoidance of new foods (called neophobia) (Kalat & Rosin, 1973). Young children will therefore show neophobic responses to a new food but must come to accept and eat foods which may originally appear to be threatening. In line with this, studies show that simply repeatedly exposing children to foods can change children’s preferences and have indicated that between 8–10 times is optimum (Birch & Marlin, 1982; Birch, 1989; Wardle et al., 2003).

Social learning or modelling reflects the impact of watching other people’s behaviour on our own behaviour and is derived from social learning theory. In terms of eating, research indicates that food preferences can be learned from role models, peers, parents and the media. For example, an early study explored the impact of ‘social suggestion’ on children’s eating behaviours and indicated a greater change in the child’s food preference if the role model was an older child, a friend or the

fictional hero. The unknown adult had no impact on food preferences (Duncker, 1938). Similarly an intervention study indicated that children who were identified as picky eaters became less picky after watching a video of older children called 'food dudes' who declared a liking for vegetables (Lowe & Horne, 1998). Likewise, research on peer modelling indicates that after one week children will change their vegetable preference according to the preferences of the child they sit with (Birch, 1980). Parents are also central to the process of social learning modelling and research indicates that children and parents not only share similar food preferences whilst still living at home (Brown & Ogden, 2004; Olivera et al., 1992), but that when they leave home parents' own behaviour is the best predictor of a child's eating behaviour after one year of independence (Dickens & Ogden, 2014). Finally, the media is also an important source for modelling and much research indicates that children's food intake and food preferences are influenced by the content and frequency of food advertising on the television (Halford et al., 2004; King & Hill, 2008; Radnitz et al., 2009).

There is also a wealth of research showing that both conditioning and reinforcement influence food preferences in children. For example, rewarding food choice with praise in the form of parental approval seems to improve food preferences. Further, using food to reward behaviour as in 'if you are well behaved you can have a biscuit' not only has positive effects on their behaviour in the short term but also makes the reward food more attractive which can encourage unhealthy food preferences if the reward food is an unhealthy food. In addition, using food to encourage the intake of other foods as in 'if you eat your vegetables you can eat your pudding' can also change food preferences and this practice has been shown to increase the preference for the reward food, but in turn decrease preference for the access food (Birch, 1999; Lepper et al., 1982; Ogden, 2014).

## How to tackle to problem

Children's diets are often suboptimal which can lead to health problems which may track through into adulthood. Research indicates that poor diets are a product of a number of factors including biology, the wider and home environment and individual beliefs and behaviour. Any solution to this problem therefore needs address these factors. This could be achieved in the following ways.

### Legislation and structural changes

It is clear from changes in smoking, seat belt wearing and plastic bag consumption that behaviour change can be achieved through changes in legislation and pricing. In terms of childhood nutrition this would involve initiatives involving the food industry to change food labelling, limit food advertising, tax high calorie, high fat and high sugar foods and banning foods such as fizzy sugary drinks which have no nutritional value. It would also involve working with schools to improve school meals and packed lunches, remove vending machines for fizzy drinks and high fat snacks, liaising with supermarkets to change food displays (i.e. the location of sweets, fizzy drinks) and food pricing initiatives which encourage overeating (i.e. meal deals). Such interventions would reduce mindless eating outside of the home and ensure that more mindful food choices were made concerning what foods to bring into the home environment. To date the UK government has recommended that the food industry behave more responsibly but is yet to enforce this through legislation (Gov.uk, 2017).

### Parenting programmes

Given that parents manage the home environment and are the role models for their children both in terms of food preferences and their beliefs about food, parenting programmes are necessary to change how parents eat as a means to change what their children eat. A recent evidence-based book by the author (Ogden, 2014) explored the ways in which parents should manage their children's

diets focusing on three key factors: managing their environment; being a good role model; saying the right things. This drew upon psychological theories of food choice and highlighted how children's relationship with food can be developed and changed through rewards, language, modelling, associations and covert control as a means to promote a positive relationship with food and healthy eating without making food into a problem. It was also based upon parenting programmes such as The Parenting Puzzle (Hunt & Mountford, 2003) designed to promote positive parenting.

## School-based interventions

The third approach to addressing childhood nutrition involves changing the beliefs and food preferences of children directly. This can occur through changes to the environment and parenting programmes as described above which in turn will impact upon how children think and act. In addition, interventions at school offer an opportunity to operationalise many of the psychological factors shown to change eating behaviour. For example, schools can be used to expose children to novel foods through school dinners, cooking lessons and garden schemes (e.g. Hendy et al., 2005; Wardle et al., 2003). They can also be used to promote healthy eating through the use of role models either via videos (e.g. Lowe & Horne, 1998) or through nominated staff or older peers who could sit with children throughout meal times (Ogden, 2013). Further, schools offer the opportunities for discussions around the role of food, healthy eating and the risks of both malnutrition and obesity through PSHE classes.

## In summary

Many children's diets are not optimal and can result in health problems which can track into adulthood. Research indicates that a child's eating behaviour is the product of a number of factors including biology, the wider and home environment and the development of food preferences throughout childhood through mechanisms such as exposure, social learning, reinforcement and associations. Any solution to this problem therefore needs to address these issues. This can be achieved through legislation and structural changes which would involve working with the food industry and government intervention; parenting programmes to encourage a healthier home environment and school-based interventions to change children's beliefs about food and their food preferences directly.

## The way forward

On the basis of evidence the following recommendations are made:

1. The government should introduce legislation to increase taxation on high fat and high sugar foods and/or enforce manufacturers to lower the amounts of fat, sugar and salt in products and/or more clearly label high fat, sugary, salty foods.
2. The curriculum of parenting programmes should include healthy eating with a focus not only on what to eat but where, when and how to eat.
3. The PSHE curriculum should include the role of food, nutrition, malnutrition, obesity and the promotion of healthy eating, exercise and a positive relationship with food.
4. Public Health England should be funded to further promote healthy eating specifically for children, and also across the whole population.

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