

# Into the mouths of babes

## Effects of infant feeding on growth and childhood obesity



Centre for Diet and Activity Research

[www.cedar.iph.cam.ac.uk](http://www.cedar.iph.cam.ac.uk)

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Fully referenced and linked at  
[www.cedar.iph.cam.ac.uk/resources/evidence](http://www.cedar.iph.cam.ac.uk/resources/evidence)

**M**ore than one in five children in England start school overweight or obese, and inequalities in these rates are widening. Childhood obesity is associated with many health risks that often persist into adult life. Efforts to prevent childhood obesity therefore need to start from birth.

### Infant weight and later life risks

Being overweight - and rapidly gaining weight - during infancy are linked with a higher risk of obesity in later life, as well as higher risks of asthma and markers of cardiovascular disease risk.

Infant weight at 1 year of age is a good predictor of childhood obesity. 90% of children who are obese at 3 years are overweight or obese as adolescents. The majority of normal weight adolescents had normal weight status at ages 1 and 2 years.

### Infant feeding and growth

As a buffer against periods of illness and food scarcity, babies tend to consume more energy than they need, as well as preferring sweet foods. This can make them susceptible to excess weight when calories are abundant. Infancy is also a period when future food preferences and eating habits are formed.

Many UK infants are overfed and overweight, as concluded in the 2018 Scientific Advisory Committee on Nutrition report *Feeding in the first year of life*. The 2011 National Diet and Nutrition Survey of Infants and Young Children found that 75% of children aged 4-18 months consumed more calories than the average requirement. A similar proportion had body weights above the 50<sup>th</sup> centile compared to the WHO growth standard.

Formula-fed babies are more likely than breastfed infants to receive excess calories and show rapid weight gain. Within six weeks after birth, some 78% of mothers are either formula-feeding or supplementing breastfeeds with some formula feeds.



Photo by Philippe Put

### Brief in brief

- The first few years of life are important for obesity prevention.
- UK infants consume more calories and have higher body weights than recommended. Rapid weight gain and overweight during infancy are consistently associated with a higher risk of obesity in childhood and adult life.
- Interventions to promote responsive feeding have been shown to be effective in supporting a healthy pattern of early growth, but are resource-intensive.
- Scalable interventions, possibly using digital technologies, are needed to support families to avoid excessive calorie intake and weight gain in infants and young children.

### Priorities for public health action

- Highlight and promote use of the recently launched [www.nhs.uk/start4life](http://www.nhs.uk/start4life) infant weaning guidance, based on principles of responsive feeding, to support the successful transition of infants onto solid foods.
- Community and primary care health professionals should help families promote optimal nutrition and growth, recognise and manage overweight in young children, and challenge unhelpful social norms that favour rapid growth and weight gain at this age.
- These efforts would be informed by including in electronic health records the Health Visitor weight measurements at ages 1 and 2-2.5 years as well as the National Child Measurement Programme measurements at ages 4-5 and 10-11 years. Inclusion of these measurements into the new Community Services Dataset (CSDS) would allow efficient monitoring of infant overweight and its changes in response to interventions.
- There is an urgent need to develop and evaluate new and scalable interventions to prevent early overfeeding and overweight. Interventions based on responsive feeding show promising effects. Digital technologies such as app or web-based formats may allow efficient delivery and sustained engagement.

## Responsive infant feeding - effective interventions

Responsive feeding is a style of parenting in which parents follow clear guidelines and rules, while recognising their children's signals of hunger and fullness. This approach has been shown to help the successful transition of infants from milk to solid foods.

While a responsive parenting approach informs the February 2019 [www.nhs.uk/start4life](http://www.nhs.uk/start4life) information, this new material does not explicitly address infant appetite, overfeeding and overweight.

In addition to seven effective behavioural interventions reported in a 2016 systematic review, two other published trials have recently shown that responsive feeding is effective in reducing calorie intake and slowing rapid weight gain.

### Evidence from the Baby Milk Trial

CEDAR's Baby Milk Trial recruited 669 healthy full-term infants receiving formula-milk within 14 weeks of birth.

The intervention was delivered to mothers till their babies were 6 months old. It aimed to reduce formula-milk intakes and promoted responsive feeding to prevent rapid weight gain. Responsive feeding advice included recognising satiety cues, not forcing babies to finish the bottle, recognising that not all crying is due to hunger, and using alternatives to feeding to soothe.

We found that the intervention:

- reduced reported milk intakes by 14% at age 3 months compared to the control group; by 12% at 4 months; 9% at 5 months; and 7% at 6 months
- slowed infant weight gain up to age 6 months

However, at age 8 months, average calorie intake was 773 kcal/day - more than 100 kcal/day higher than the estimated average requirement of 666 kcal/day.

And the intervention had no effect on weight gain to 12 months, when formula-milk was no longer the main source of energy. This shows the importance of appropriate weening.

The intervention did increase positive maternal attitudes to healthy infant feeding recommendations.

Interviews with study participants revealed that mothers liked the non-judgmental support provided during the trial. Previously, some had experienced stigma for not breastfeeding, and received limited advice on how, how much and how often to give formula-milk.

The information printed on formula-milk tins or provided by family, friends and health professionals was often perceived by mothers as contradictory. The trial guidance to avoid excess feeding conflicted with unhelpful social norms that favour plentiful feeding and rapid weight gain at this age.

### Insight from INSIGHT

The INSIGHT (Intervention Nurses Start Infants Growing on Healthy Trajectories) trial recruited 279 first-time mothers in the USA.

The intervention was delivered from ages 2 weeks to 30 months and used responsive parenting to improve feeding, sleep, interactive play and emotion regulation. It was effective in reducing child BMI at age 1 and 3 years.

### Future interventions

Previous trials delivered their interventions by face-to-face visits and showed that support needs to be sustained in order to maintain any effect on healthy weight gain. Delivering such resource demanding interventions to wider populations is a major challenge for already stretched health and public health services.

As an efficient alternative approach, digital technologies are increasingly being used to promote healthy behaviours. These need careful development for the user formats and messages to be engaging and salient to the target audience.



## Key references and resources

- Fully linked and referenced version of this Brief at [www.cedar.iph.cam.ac.uk/resources/evidence](http://www.cedar.iph.cam.ac.uk/resources/evidence)
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