

# Dietary Advice, Pregnancy & Breastfeeding



Dietary advice given to women before, during and after pregnancy is intended to support both maternal and infant health, and is based on the best available evidence. This note focuses on the latest UK dietary advice given to women from family planning through pregnancy and into breastfeeding. It examines the science behind the advice, trends in its take up, how it compares with international advice and options for improving take up.

## Background

Dietary behaviours before conception, throughout pregnancy and in the first six months of infancy can have important long-term implications for the health of mothers and babies. Government advice emphasises the importance of good pre-conception health<sup>1</sup> and includes dietary advice during pregnancy and advice on breastfeeding (see Box 1). For example, maternal obesity increases the risk of: developing infertility; diabetes during pregnancy (gestational diabetes); and miscarriage. It also increases the risk of stillbirth and of obesity for the child. The focus on preconception health and on maintaining a healthy diet throughout pregnancy and breastfeeding may deliver health benefits at the individual and population levels.

## Evidence Base

### Supplements, Nutrients and Energy

#### *Folic Acid*

Women planning a pregnancy, or who are within the first 12 weeks of their pregnancy are advised to take a supplement of 400 µg folic acid daily.<sup>2</sup> This is based on consistent evidence that folic acid supplementation from pre-conception to week 12 of a pregnancy prevents neural tube defects (NTD) such as spina bifida and anencephaly. There is also some evidence that folic acid can reduce the risk of cleft lip. Women at increased risk of having a pregnancy

## Overview

- Dietary guidelines for pregnant and breast-feeding women include advice to take certain supplements and to avoid specific foods during pregnancy.
- New mothers are also advised to breastfeed exclusively for 6 months.
- Government advice is based on the most robust evidence available.
- Some of the advice is well understood and taken up by expectant and breastfeeding mothers. However take-up varies for example depending on age, ethnicity and socio-economic status.
- The UK Government has policies in place to target advice to those who need it most. However, there are other options that might improve take up and monitoring of dietary advice in pregnancy and breastfeeding.

### Box 1. UK Dietary Advice and Breastfeeding Guidelines

Dietary advice in pregnancy and breastfeeding, and breastfeeding guidelines, are issued by the Government. They are a consolidation of advice from the Department of Health (DH), Public Health England (PHE), the Scientific Advisory Committee on Nutrition (SACN), the National Institute of Health and Care Excellence (NICE), and the Food Standards Agency (FSA) in Scotland and Northern Ireland. The government advises women to follow a healthy diet as well as the specific guidance below.

- **When planning a pregnancy** – maintain a healthy body weight (body mass index between 18.5 and 24.9), take folic acid supplements<sup>2</sup> and avoid alcohol.<sup>3</sup>
- **During pregnancy** – continue taking folic acid until the 12th week and take a 10 µg supplement of vitamin D throughout pregnancy.<sup>4,5</sup> Avoid alcohol and eating certain foods such as soft cheese with white rind (Brie), blue cheese, unpasteurised milk products, raw and undercooked meats, vitamin A rich foods and supplements and shark, swordfish and marlin.<sup>6</sup> Limit consumption of tuna and caffeine (200 mg/day, around two cups of coffee)<sup>7</sup> and consider increasing energy consumption by 200 kcals/day between six and nine months of pregnancy.<sup>8</sup>
- **Breastfeeding** – breastfeed exclusively for six months, increase calcium intake to 1250 mg/day<sup>4</sup> and continue to take vitamin D supplements and to limit caffeine and alcohol consumption.

affected by NTD (for example those with a family history of NTD) are advised to take a higher dose (5,000 µg).

### *Vitamin D*

There is evidence linking maternal vitamin D deficiency with impaired foetal growth and bone development. It has also been linked with low birth-weight, pre-eclampsia and impaired foetal lung development, although evidence from larger trials would be needed to establish causality.

Few foods are a good source of vitamin D. Making vitamin D in the body requires direct skin exposure to UVB rays from the sun. In practice, this mainly happens in spring and summer in the UK. Vitamin D levels thus vary seasonally and are also influenced by cultural and lifestyle factors that limit an individual's exposure to sunlight. The National Diet and Nutrition Survey (NDNS) provides evidence of low vitamin D levels among the UK population, including in young women of child bearing age.<sup>9</sup> Based on new advice<sup>10</sup> from the Scientific Advisory Committee on Nutrition (SACN), Public Health England (PHE) advises:<sup>5</sup>

- pregnant and breastfeeding mothers and children age 1-4 years to take a supplement of 10 µg /day vitamin D<sup>5</sup>
- babies under 1 year should have a daily vitamin D supplement of 8.5 to 10 µg.

### *Calcium*

Calcium is essential for bone growth as it is required for the mineralisation of bone. Additional dietary calcium is not needed if the mother has an adequate dietary intake, as calcium absorption from the intestine increases from 20-30% to 60% during the last three months of pregnancy to meet the demands of the foetus. However, during breastfeeding this does not persist and around 250 mg of calcium is secreted in breast milk each day. The Department of Health (DH) thus recommends breastfeeding mothers to increase their calcium intake by 550 mg/day to 1250 mg/day.

### *Energy Intake*

During pregnancy, energy is needed for placental and foetal growth and for the growth of maternal tissues. There are also increased energy costs associated with maintaining a larger body mass, particularly after 25 weeks gestation. During breastfeeding, energy is both lost as secreted milk and expended in producing milk. Some of these costs may be offset in pregnancy by adaptive changes in activity and in maternal metabolism, and fat reserves provide some energy when breastfeeding. Government advises that some women may need to increase their energy intakes during pregnancy and breastfeeding (Box 1) but the bigger concern is the additional health risks to mother and baby posed by maternal obesity discussed previously.<sup>1</sup> While the greater focus on pre-conception dietary advice may have health benefits for planned pregnancies, it will not address pregnancies that are unplanned.<sup>1</sup>

## **Substances to Reduce or Avoid**

### *Caffeine*

Maternal caffeine intake has been associated with a reduction in birth weight and an increased risk of miscarriage.<sup>7</sup> Low birth weight is associated with increased risk of infant illness and death, and longer-term risks of

chronic disease and impaired cognitive development. A review of the evidence concluded that there was insufficient evidence to identify a threshold level of caffeine below which there is no increased risk, but suggested that such risks are increased in association with intakes of 200 mg/day. The current advice (Box 1) reflects this suggestion.<sup>7</sup>

### *Alcohol*

While the damaging effects of 'heavy' drinking in pregnancy are well established, evidence about the effects of moderate consumption of alcohol during pregnancy is less conclusive. In the past, this has led to a lack of consensus between advisory bodies, differing advice (Box 2) and potential confusion for mothers. The CMO has proposed new guidelines advising women who are pregnant or planning a pregnancy that the safest approach is not to drink alcohol.<sup>3</sup> A recent study found that even mothers adhering to the previous guidelines were at increased risk of lower birth weight or pre-term birth compared to non-drinkers.

### *Foods to Avoid*

During pregnancy, the mother's immune system is weaker than normal and therefore less able to fight infections. The baby's immune system has yet to develop, making it more vulnerable to infections. Listeria is a particular concern as it can cause miscarriage or stillbirth, so pregnant women are advised to avoid soft blue-veined cheeses and pate.<sup>6</sup> Other concerns include salmonella from raw or undercooked eggs, and food poisoning from raw or undercooked meat. Pregnant women are also advised to avoid shark, swordfish and marlin and to limit consumption of tuna because of possible exposure to mercury that could damage the developing foetus's nervous system. Finally, vitamin A rich foods (such as liver) and supplements should be avoided during pregnancy because high levels of vitamin A have been linked to birth defects.

## **Breastfeeding and Maternal Health**

Several studies have found a link between breast-feeding and reduced risk of maternal breast cancer prior to the menopause. One large US study showed that women who had ever breastfed were less likely to suffer pre-menopausal breast cancer compared with those who had never breastfed. An analysis of all well conducted large studies has also shown a protective effect of ever breastfeeding against certain types of breast cancers.

Studies also suggest that breastfeeding can help protect against some types of ovarian cancer. However, the results here are inconsistent, particularly on the duration of breastfeeding needed for the protective effect. For example, an Australia-wide study showed a strong association between total duration of breastfeeding and reduced ovarian cancer, with protection increasing per month of breast-feeding. In contrast, a multinational study showed a 20-25% decrease in risk of ovarian cancer among women who lactated for at least two months (compared with those who had not) but with no further decrease in risk with increasing duration of lactation beyond this.

Breastfeeding has also been shown to have a beneficial effect on the mother's bone mineral density in the long term, despite a short-term decrease in bone mineral density during pregnancy and breastfeeding. In adolescent mothers, breastfeeding is associated with greater bone mineral density for the mother during adulthood. An international review of the evidence in 2012 showed that breastfeeding for six months, compared with three to four months, was linked to more rapid maternal weight loss after birth, and delayed return of menstrual periods.

### Breastfeeding and Infant Health

The advice to breastfeed exclusively (no solids or liquids besides human milk, other than vitamins and medications) for six months (Box 1) is based on evidence from reviews that it protects against gastrointestinal infections (GI). In a UK-based study, infants who were breastfed for 13 weeks or more had significantly less GI than those who were formula-fed from birth, whereas infants who were breastfed for less than 13 weeks had similar GI rates to those who were formula-fed. A study in Belarus compared 2,862 infants exclusively breastfed for three months (with continued combination feeding – using a combination of breast and infant formula feeding – to six months) with 621 infants who were exclusively breastfed for six months. The six month exclusively breastfed group showed a significant reduction in the incidence of GI during months three to six.

Longitudinal studies, where families are tracked over time, allow researchers to study possible links between breast feeding and a range of other health outcomes in infants and adolescents. Such studies suggest that breastfeeding is associated with a reduced risk of childhood obesity, and increased educational attainment and upward social mobility (both up to adolescence). However, the nature of these types of studies mean that there is uncertainty over whether these associations are causal.<sup>11</sup>

## Take Up of Dietary Advice

### Breastfeeding Rates

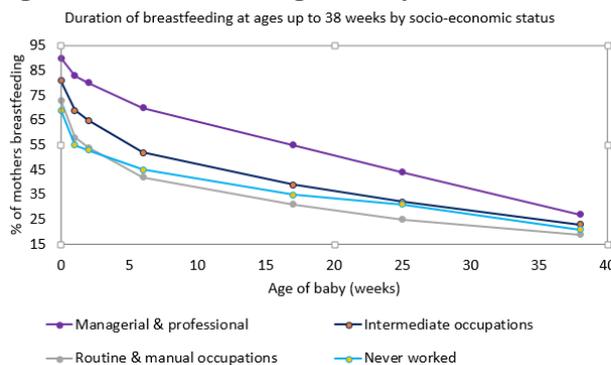
Clinical Commissioning Groups organise and deliver NHS services locally and collect data on rates of breast-feeding from birth and at 6-8 weeks. More detailed data (beyond 8 weeks) were provided by the Infant Feeding Survey (IFS).<sup>12</sup> The most recent IFS (2010) showed that, across the UK:

- 69% of women started exclusive breastfeeding from birth, but this fell to 46% at one week, 23% at six weeks and 1% at six months, showing that very few mothers follow the six month exclusive breastfeeding advice.
- 81% of women started breastfeeding (both exclusive and combined) from birth, an increase from the 76% in 2005. This fell to 69% at one week, to 55% at six weeks, and at six months, 34% were still breastfeeding.
- These headline figures hide variations in breastfeeding by age (younger mothers are less likely and older mothers more likely to breastfeed), ethnicity (mothers from minority ethnic groups are more likely to breastfeed) and socio-economic status (with women in lower SES groups less likely to breastfeed, see Figure 1). The reasons for these findings are likely to be complex.

### Box 2. Advice on Alcohol Consumption

Prior to 2016, the Department of Health recommended that 'pregnant women should avoid alcohol altogether, but should they choose to, they should drink no more than 1-2 units of alcohol once or twice a week at any stage of the pregnancy, and avoid binge drinking'. In January 2016 the CMO updated this advice to note that 'the safest approach is not to drink alcohol at all during pregnancy'.<sup>3</sup> This advice is consistent with that from the Royal College of Midwives and NHS Health Scotland which both advise pregnant women to abstain from drinking alcohol altogether.

**Figure 1. UK Breastfeeding Rates by SES**



### Supplement Use and Awareness

Data collected in the IFS<sup>12</sup> show the clearest picture for folic acid, where 37% of women took the supplement pre-conception, and 79% during the first three months of their pregnancy. Awareness of the advice was also high; 71% of mothers across the UK knew why increasing intakes of folic acid was recommended. With vitamin supplements, the picture is a lot less clear. Some women took multivitamins (11%), some took iron combined with multi-vitamins (18%) and others took iron only (28%). As for vitamin D, only 3% of women recalled taking a supplement, with a further 3% reporting taking Healthy Start vitamins (which contain folic acid and vitamins C and D).

### Alcohol and Caffeine Consumption

Data collected in the IFS showed that 40% of women drank alcohol during pregnancy, but only 3% reported drinking more than 2 units a week on average. However, in a recent study, over 50% of women in the first three months of pregnancy reported alcohol intakes above the Government's previous advice of less than two units a week. There are no routine data for caffeine consumption during pregnancy.

### International Comparisons

Dietary advice to pregnant and breastfeeding women issued by international bodies such as the World Health Organisation (WHO) and national governments differs from the UK advice in several areas. For example:

- Micronutrient intakes – while the WHO and UK advice on folic acid and vitamin D are largely similar, the WHO also recommends iron supplementation throughout pregnancy, and calcium supplementation from 20 weeks. According to the Endocrine Society and the WHO, the iodine intake recommendation is higher for pregnant and breastfeeding women than for adults. This is to reduce the risk of impaired foetal brain development. SACN is monitoring

the evidence to see whether current UK public health guidance needs updating.

- **Weight gain** – in the USA, all pregnant women are given guidance about keeping a healthy weight range through the course of their pregnancy (based on their pre-conception weight). The UK does not offer such advice, but does have specific guidelines for the management of women with obesity, diabetes or gestational diabetes.
- **Infant Feeding** – in 2001, the WHO changed its advice on exclusive breastfeeding from 4-6 months, to six months. This was based on the findings from a systematic review, which suggested that exclusive breastfeeding for six months offered most protection against GI. DH adopted the WHO advice in 2003. However, some experts have called for a review of the evidence base for this decision. A SACN subgroup is currently reviewing evidence on complementary and young child feeding.

### Improving Uptake of Advice

Evidence from the IFS and elsewhere suggests there is scope for improving the take up of dietary advice by pregnant and breastfeeding women, particularly those who are young and/or more disadvantaged.

#### Advice on Alcohol

The main government and professional bodies all advise pregnant women that abstaining from alcohol during their pregnancy is the safest option (Box 2). While this advice is now consistent (Box 2), it has been criticised by charities such as the British Pregnancy Advisory Service (BPAS) which argues that there is little evidence that drinking in moderation (1 or 2 units a week) during later pregnancy is harmful. BPAS suggests that the advice to abstain is based on the presumption that women are not able to understand the difference between moderate- and binge-drinking.<sup>13</sup>

#### Information from research and evaluation

The impact of dietary advice was evaluated by surveys such as the IFS,<sup>12</sup> a rolling programme conducted every five years since 1975. However, DH withdrew funding for the 2015 survey and introduced the new Maternity and Children's Data Set (MCDS). SACN's Subgroup on Maternal and Child Nutrition has noted the need for more detailed and robust data on infant feeding to be included in the MCDS. The Scottish Government is launching a new survey of infant feeding in Scotland in 2017.<sup>14</sup>

#### Population Level Interventions: Fortification

SACN has recommended mandatory folic acid fortification of flour (a staple component of the UK diet).<sup>2</sup> This has yet to be adopted but would help ensure that women had appropriate folic acid levels prior to conception. Some food companies voluntarily fortify products such as breakfast cereals, but others have reduced the amounts of folic acid in their products. In 2016, following a request from Food Standards Scotland, SACN announced a further review of recent evidence concerning the potential risks of folic acid fortification. The draft report is open for consultation until March 2017.

#### Box 3. Baby and Young Family Initiatives

- **The Healthy Start Scheme** is a UK-wide programme which aims to improve the health of pregnant women and families on benefits or low incomes. Qualifying women and families receive vouchers that can be used to buy cow's milk, fresh or frozen fruit and vegetables, and infant formula milk, plus coupons that can be exchanged for free vitamins. Nutrition and health information is sent with the vouchers to reinforce the scheme's role as a public health measure. The Infant Feeding Survey (IFS) showed that 58% of eligible mothers registered onto the scheme; 59% of those were not aware of the scheme prior to completing the IFS questionnaire.
- **The UNICEF UK Baby Friendly Initiative** provides a framework for the implementation of best practice by NHS trusts, other health care facilities and higher education institutions. Facilities and institutions that meet the required standards are assessed and accredited as Baby Friendly. NHS Scotland is committed to implementing this standard in every hospital.
- **The Nourishing Start for Health (NOSH) Study** is investigating whether offering vouchers to mothers increases the prevalence and duration of breastfeeding. It is being conducted in South Yorkshire and the East Midlands.<sup>15</sup>

### Targeted Interventions

Targeted interventions and support are aimed at those most in need, such as younger women or women from lower SES groups. For example, the UK Healthy Start Scheme targets pregnant women and families on benefits, while the UNICEF UK Baby Friendly Initiative is a hospital based scheme to encourage breastfeeding (Box 3). There are also studies (Box 3) trialling the use of financial incentives, as these have been effective for other health behaviours.

Policies to improve the diet of mothers and their babies may provide a basis for healthy diets throughout life. For example, the All Party Parliamentary Group for Conception to Age Two and the CMO have both highlighted the importance of good health and diet when planning a pregnancy. The 2014 CMO Report<sup>1</sup> also noted the need for the health system to engage young people about the links between their health and the health of their future children. The Healthy Child program aims to achieve this by setting a schedule of services covering care from 28 weeks of pregnancy to age 5. These include screening, immunisation and health and development reviews (at 28 weeks pregnant, within 2 weeks of birth, and at 6 to 8 weeks, 0 to 12 months and 2 to 2.5 years). Finally, improving maternal health and instilling healthy behaviours in early infancy will be important in implementing the DH's new childhood obesity plan.

#### Endnotes

1. *CMO Annual Report 2014*, DH, Dec 2015
2. *Folate and disease prevention*, SACN, 2006
3. *Summary of the proposed new guidelines*, CMO, Jan 2016
4. *Dietary reference values for food energy and nutrients for the UK*, DH, 1991
5. [www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-D.aspx](http://www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-D.aspx)
6. *Foods to avoid in pregnancy*, NHS Choices
7. *Statement on the reproductive effects of caffeine*, COT, 2008
8. *Dietary reference values for energy*, SACN, 2011
9. *National Diet and Nutrition Survey: Results from Years 1-4*, FSA/PHE, 2014
10. *Vitamin D and health*, SACN, July 2016
11. see <http://www.closer.ac.uk/evidence/breastfeeding/> for a summary
12. McAndrew et al, HSCIC Infant Feeding Survey, 2010
13. *Alcohol-in-pregnancy, what are the issues?*, BPAS briefing
14. Draft Minutes of the Subgroup on Maternal and Child Nutrition, Oct, 2016
15. Relton C et al, *BMJ Open*, 2016;6:e010158