Nutrition in Pregnancy

A healthy and varied diet is important at all times in life, but particularly so during pregnancy. The maternal diet must provide sufficient energy and nutrients to meet the mother's usual requirements, as well as the needs of the growing fetus, and enable the mother to lay down stores of nutrients required for fetal development as well as for lactation. The dietary recommendations for pregnant women are actually very similar to those for other adults, but with a few notable exceptions. The main recommendation is to follow a healthy, balanced diet based on the Balance of Good Health* model. In particular, pregnant women should try to consume plenty of iron- and folate-rich foods, and a daily supplement of vitamin D (10 µg/day) is recommended throughout pregnancy.

There are currently no official recommendations for weight gain during pregnancy in the UK. For women with a healthy pre-pregnancy weight, an average weight gain of 12 kg (range 10–14 kg) has been shown to be associated with the lowest risk of complications during pregnancy and labour, and with a reduced risk of having a low birthweight (LBW) infant. However, in practice, well-nourished women with a normal pre-pregnancy bodyweight show wide variations in weight gain during pregnancy. Low gestational weight gain increases the risk of having a LBW infant, whereas excessive weight gain during pregnancy increases the risk of overweight and obesity in the mother after the birth.

A birthweight of 3.1–3.6 kg has been shown to be associated with optimal maternal and fetal outcomes for a full-term infant. LBW (birthweight < 2.5 kg) is associated with increased infant morbidity and mortality, as well as an increased risk of adult diseases in later life, such as cardiovascular disease and type 2 diabetes. The fetal origins hypothesis states that chronic diseases in adulthood may be a consequence of 'fetal programming', whereby a stimulus or insult at a critical, sensitive period in development has a permanent effect on structure, physiology or function. However, there is little evidence that in healthy, well-nourished women, the diet can be manipulated in order to prevent LBW and the risk of chronic diseases in later life.

Maternal nutritional status at the time of conception is an important determinant of fetal growth and development, and therefore a healthy, balanced diet is important before, as well as during, pregnancy. It is also important to try and attain a healthy bodyweight prior to conception (BMI of 20–25), as being either underweight or overweight can affect both fertility and birth outcome. It is now well recognised that taking folic acid during the peri-conceptional period can reduce the incidence of neural tube defects (NTDs), and all women who may become pregnant are advised to take a folic acid supplement of 400µg/day prior to and up until the 12th week of pregnancy.

The UK Committee on Medical Aspects of Food Policy (COMA) panel has established dietary reference values (DRVs) for nutrients for which there is an increased requirement during pregnancy. This includes thiamin, riboflavin, folate and vitamins A, C and D, as well as energy and protein. The energy costs of pregnancy have been estimated at around 321 MJ (77 000 kcal), based on theoretical calculations and data from longitudinal studies. In practice, individual women vary widely in metabolic rate, fat deposition and physical activity level, so there are wide variations in individual energy requirements during pregnancy. In the UK, the recommendation is that an extra 200 kcal of energy per day is required during the third trimester only. However, this assumes a reduction in physical activity level during pregnancy, and women who are underweight or who do not reduce their activity level may require more.

The COMA DRV panel did not establish any increment in requirements for any minerals during pregnancy, as physiological adaptations are thought to help meet the increased demand for minerals, e.g. there is an increase in absorption of calcium and iron. However, certain individuals will require more calcium, particularly teenagers whose skeletons are still developing. Up to 50% of women of childbearing age in the UK have low iron stores, and are therefore at risk of developing anaemia should they become pregnant. Moreover, around 40%
of women aged 19–34 years currently have an iron intake below the lower reference nutrient intake (LRNI). Pregnant women are therefore advised to consume plenty of iron-rich foods during pregnancy and, in some cases, supplementation may be necessary.

There are a number of food safety issues that apply to women before and during pregnancy. It is advisable to pay particular attention to food hygiene during pregnancy, and to avoid certain foods (e.g. mould-ripened and blue-veined cheeses) in order to reduce the risk of exposure to potentially harmful food pathogens, such as listeria and salmonella. Pregnant women, and those who may become pregnant, are also advised to avoid foods that are high in retinol (e.g. liver and liver products), as excessive intakes are toxic to the developing fetus. It is also recommended that the intake of both alcohol and caffeine is limited to within current guidelines.

As for the general population, pregnant women should try to consume at least two portions of fish per week, one of which should be oil-rich. However, in 2004, the Food Standards Agency (FSA) issued new advice on oil-rich fish consumption and now recommends a limit of no more than two portions of oil-rich fish per week for pregnant women (and those who may become pregnant). Oil-rich fish is a rich source of long-chain n-3 fatty acids which are thought to help protect against heart disease. Furthermore, these types of fatty acids are also required for fetal brain and nervous system development. The upper limit on oil-rich fish consumption is to avoid the risk of exposure to dioxins and polychlorinated biphenyls (PCBs), which are environmental pollutants. Pregnant women are also advised to avoid marlin, shark and swordfish, and limit their intake of tuna due to the risk of exposure to methylmercury, which at high levels can be harmful to the developing nervous system of the fetus.

There are certain considerations with regard to specific dietary groups during pregnancy. For example, vegetarians and vegans may have difficulty meeting their requirements for certain vitamins and minerals, particularly riboflavin, vitamin B12, calcium, iron and zinc. However, most vegan and vegetarian women should be able to meet their nutrient requirements during pregnancy, with careful dietary planning, while those on very restricted diets may also need to consume fortified foods or supplements.

Pregnancy during adolescence raises a number of nutritional concerns. Teenagers already have high nutrient requirements for growth and development, and therefore there is potential competition for nutrients. Furthermore, a large proportion of teenage girls have low intakes of a range of nutrients that are important during pregnancy, particularly folate, calcium and iron. Teenagers who become pregnant often do not take folic acid supplements, either because the pregnancy is unplanned, or because they are unaware of the importance of taking folic acid. Teenage pregnancy therefore presents particular challenges for health professionals.

As well as following a healthy, balanced diet during pregnancy, staying physically active is also important, to promote general health and well-being, and also to help prevent excess maternal weight gain. Studies that have looked at the effects of maternal physical activity on pregnancy outcome have been of variable quality, but there is little evidence that moderate exercise can have any adverse effects on the health of the mother or the fetus. Studies do suggest that regular, aerobic exercise during pregnancy helps improve or maintain physical fitness and body image. It is recommended that pregnant women should continue with their usual physical activity for as long as feels comfortable, and try to keep active on a daily basis, e.g. by walking. Swimming is a particularly suitable form of exercise, although it is advisable to avoid strenuous or vigorous physical activity during pregnancy.

* The Balance of Good Health model was replaced with the eatwell plate in Autumn 2007.

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