PREGNANCY

(5) NUTRITION IN PREGNANCY

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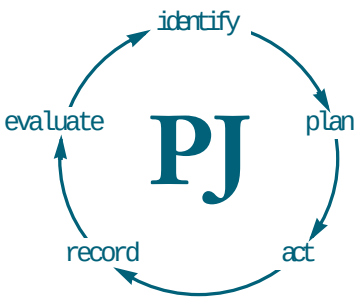
A healthy diet is important for everyone, but for expectant mothers, particular care should be taken to ensure the diet is as healthy as possible. This article looks at nutritional requirements before and during pregnancy, and during breastfeeding



identify gaps in your knowledge

1. List three types of food that pregnant women should avoid.
2. Which supplements can you recommend to a pregnant woman?
3. Which pregnant women are more likely to suffer from iron deficiency anaemia?

This article relates to the Royal Pharmaceutical Society's core competency of "appropriate advice, referral or selection of treatment" (see "Medicines, ethics and practice — a guide for pharmacists", number 26, July 2002, pp105–6). You should consider how it will be of value to your practice.

Women thinking about having a baby should be encouraged to evaluate their diets and make any necessary changes, such as increasing intake of fruit and vegetables to at least five portions a day, basing meals and snacks on high-fibre carbohydrate foods, reducing consumption of fatty or sugary foods and limiting salt intake.

With more than half of adults in the United Kingdom now overweight or obese, it is likely that a significant proportion of women thinking about having a baby will already be overweight. In overweight women, reducing body mass index decreases the risk of hypertension and gestational diabetes, but "crash dieting" to lose the desired weight is not appropriate because it can lead to nutrient deficiency. Instead, steady weight loss should be achieved gradually by reducing energy intake yet ensuring that a diet rich in nutrients remains. Some women may need guidance on how to do this. In essence, a woman will need to reduce her intake of foods that provide little other than calories (ie, fatty or sugary foods), replacing them with foods of high nutritional quality (ie, fruit, vegetables, wholegrain cereals, bread, pulses, low fat dairy foods, lean meat and fish) if required. Drinks should not be forgotten as a source of calories. Fruit juices, squashes, fizzy drinks of the non-diet variety and alcoholic drinks can add considerably to total energy intake, and anyone attempting to lose weight should be encouraged to choose water and the occasional coffee or ordinary tea as alternatives.

Women who who have a BMI of less than 20 should be encouraged to gain weight if possible, not by increasing consumption of fat or sugar, but by eating more bread, potatoes, rice and cereals. Drinking extra milk and fruit juice is also helpful. The aim for all women planning to have a baby should be to shift BMI towards the ideal range (between 20 and 25) before pregnancy begins. Having an ideal body weight may improve the chances of conception — being underweight or overweight is associated with fertility problems.

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Folic acid Folic acid is a vitamin B that is essential for cell division, and folate levels seem to be crucial during early pregnancy. An inadequate supply of folate at the time of neural tube closure (about 28 days after conception) has been shown to increase the risk of neural tube defects (NTDs) such as spina bifida, and folate supplementation has been shown to reduce this risk. Because folate exerts its influence at such an early stage of pregnancy, women who are planning a pregnancy should therefore be advised to take a supplement.

In the case of women with no history of NTDs in previous offspring, themselves or their partner, the appropriate dose is 400µg daily, continuing until the 12th week of pregnancy. In women who do have an NTD history, the appropriate dose is 5mg daily. Women who have epilepsy are also at a greater risk of having an offspring with an NTD and should also take a 5mg folic acid supplement (*PJ*, 1 March, pp305–7).

Women can also be encouraged to eat foods that are naturally folate rich, such as Brussels sprouts, spinach and broccoli, or foods that have been fortified with folates.

Vitamin A There are two types of vitamin A: pre-formed vitamin A (retinol or retinyl esters found in animal products) and carotenes (found in plants). The recommended daily amount of vitamin A is 800µg). During pregnancy, liver (which can have a high and variable vitamin A content) and products made from it should be avoided because of the link between high intakes of vitamin A and birth defects.

Other dietary sources of vitamin A need not be avoided because the vitamin A content is not high enough to pose a risk. The Department of Health has recommended that pregnant women should avoid all supplements (eg, multivitamins, fish oils) containing pre-formed vitamin A.

DURING PREGNANCY

During pregnancy it is important to maintain a healthy diet, to continue to take a folic acid supplement until the 12th week of pregnancy and to avoid high intakes of vitamin A. There is no need to eat a special diet and the old idea of "eating for two" has been discounted.

Only about 6g of extra protein is required each day during pregnancy and, even in the last three months of pregnancy, average energy requirement increases by only 200kcal a day. However, requirements vary so much that it is difficult to predict how many calories any individual woman will need. Women should therefore be advised to eat to appetite, unless excessive weight gain starts to occur.

Calcium and vitamin D The requirement for calcium increases considerably during pregnancy but, owing to maternal adaptation (increasing calcium absorption), there is no real need for increased intake. Nevertheless, eating calcium-rich foods, particularly milk and dairy foods, which are the most concentrated source of bioavailable calcium, should be encouraged, although the dangers of unpasteurised products should be considered (see below). In addition, vitamin D, which helps the absorption of calcium, should be considered. This is normally obtained from exposure of the skin to sunlight, but this source may not be adequate to provide for the increased requirements of pregnancy. Moreover, vitamin D is not widely present in foods so a daily supplement of 10µg is advisable.

Iron Iron is needed during pregnancy for expansion of red cell mass and fetal development. However, normally, the amount of dietary iron the mother requires does not increase because of adaptations in the maternal physiology (ie, absorption increases with increasing need) and reduction in iron losses due to cessation of menstruation. Although most women in the United Kingdom do not need to increase iron intake, iron deficiency can occur in a pregnant woman if her iron stores are depleted before pregnancy (eg, from dieting, heavy periods, a recent pregnancy), if she suffers from hyperemesis or if she has a multiple pregnancy.

Iron deficiency is the most common cause of anaemia in pregnancy. Anaemia has been defined as a condition in which the haemoglobin content of blood is lower than normal as a result of a deficiency of one or more essential nutrients (World Health Organization). Prevalence varies between countries, ranging from 3.5 to 56 per cent of pregnant women. Anaemia poses risks for both the mother and the fetus. It has been linked to maternal death and it has also been linked with a low birth weight because oxygen delivery to the placenta and fetus is impaired.

People with iron-deficiency anaemia are usually asymptomatic but symptoms, particularly in severe anaemia, can include weakness, fatigue, pallor, sore tongue, brittle nails, shortness of breath, frontal headaches and pica (craving and eating abnormal materials like coal or chalk). Iron status can be assessed using a number of laboratory blood tests. Usually, a haemoglobin concentration of lower than 120g per litre and a reduced mean cell volume indicate anaemia. The red blood cells look small (microcytic) and pale (hypochromic) under a microscope. Other indicators are serum ferritin levels (less than 15mg/ml) and the amount of haemoglobin per red blood cell.

Treatment usually involves taking iron salts orally, continuing for three months after a normal haemoglobin concentration is achieved to ensure that iron stores are replenished. A common dose is 200mg ferrous sulphate three times a day.

Prophylaxis of iron-deficiency anaemia in pregnancy is only recommended for women who are at particular risk of deficiency (eg, have a poor diet). A prophylactic dose would be 200mg ferrous sulphate daily. Taking an oral iron preparation can cause or worsen constipation and in such cases it may be helpful to try a different iron salt. All pregnant women can be encouraged to eat foods rich in iron (eg, red meat, pulses, wholegrain bread and cereals, green vegetables). For vegetarians, vitamin C intake (eg, a tomato, a glass of orange juice) is particularly important because it improves the absorption of iron from non-meat sources.

Alcohol Excessive alcohol intake is hazardous at any stage of pregnancy and alcohol abuse can result in fetal alcohol syndrome, which is characterised by mental and physical retardation. How much of a hazard more limited alcohol intake presents is unclear, but the most likely period of risk is during early pregnancy, so women planning a pregnancy should be advised to make adjustments to their alcohol intake before pregnancy begins, limiting it to no more than two units a week. Indeed during the early weeks of pregnancy, alcohol is probably best avoided altogether, although once embryogenesis is complete, the occasional drink (eg, up to two units a week) is unlikely to do much harm.

Caffeine Caffeine should be consumed only in moderation during pregnancy and the UK Food Standards Agency Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment has recommended that daily intake should not exceed 300mg. This is roughly equivalent to three average size mugs of instant coffee. Table 1 lists the caffeine content of some beverages and foods.

TABLE 1: CAFFEINE CONTENT OF SOME BEVERAGES AND FOODS

Beverage/food	Caffeine content
Average cup of instant coffee	75mg
Average cup of brewed coffee	100mg
Average cup of tea	50mg
Regular cola drink	up to 40mg
Small bar of chocolate	up to 50mg

Cravings Several women experience cravings and taste alterations during pregnancy. Provided that the diet is not substantially altered, there is little danger to either the mother or the fetus. Going off tea and coffee, is a common example which will do no harm, although craving for sweet or fatty foods may encourage excessive weight gain and discourage consumption of more nutritious foods.

FOOD HYGIENE

Food hygiene is important at all times, but particularly during pregnancy when there are particular risks from food-borne infections. Common sense preventive measures include:

- Washing hands before and after food preparation
- Defrosting and cooking food thoroughly
- Ensuring that all reheated food is piping hot
- Not storing or preparing raw meat near to other food (eg, place raw meat on the bottom shelf of the fridge, not above other food)
- Washing hands before eating
- Discarding food passed its use-by-date

In addition, pets are best kept out of the kitchen and hands should always be washed after handling them. Different utensils and bowls should be used for pets and these should be washed away from those used by people.

Salmonellosis Salmonella can cause severe gastroenteritis, and the risk of infection is increased during the first three months of pregnancy when resistance to any infection may be weak. Although salmonellosis cannot pass to the fetus, to protect the mother's health, it is wise to avoid any infection during pregnancy.

The most likely sources of salmonella are raw eggs consumed in home-made mayonnaise or desserts. Pregnant women should be advised to ensure that all the eggs they consume are bought fresh, stored in the fridge and cooked thoroughly. Raw or undercooked meat also carries a risk of salmonellosis and should be avoided.

Listeriosis Listeriosis is a rare infection, affecting about one in 20,000 pregnancies. It causes a mild, flu-like illness in the mother, but can also cause miscarriage or stillbirth. Unpasteurised milk, patés, blue-veined cheese (eg, Danish Blue, Gorgonzola, Roquefort, Stilton, Blue Brie) and soft unpasteurised cheese (eg, Brie, Cambozola, Camembert) are the main culprits. Safe cheeses include all types of hard cheese and soft cheese that is processed (eg, cottage cheese, Philadelphia, Quark, Ricotta, cheese spreads).

Toxoplasmosis Toxoplasmosis is an infection that affects one in 50,000 pregnancies. It is caused by a parasite found in raw meat and unpasteurised milk as well as in soil and cats' faeces. Anyone can be at risk of this infection, but if acquired during pregnancy it can cause severe fetal abnormalities. To reduce the risk, women should be advised to ensure all meat is thoroughly cooked and only to use milk that has been pasteurised. Vegetables should be washed thoroughly before consumption.

It is important to avoid cat litter, but if this is not possible, protective gloves should be worn. In addition, gloves should always be worn when gardening. It is also best to avoid contact with lambs and sheep that have just given birth.

AFTER PREGNANCY

Eating a healthy diet remains important after pregnancy. Even if the new mother feels that she has neither the time nor the energy to cook, quick healthy meals and snacks (eg, baked potatoes, baked beans on toast, salads, fruit) are a useful option.

Energy requirements increase considerably for women who are breast feeding. Some of the extra energy required is obtained from the stores of adipose tissue laid down during pregnancy and breast feeding helps women to lose weight and regain their shape. However, the Department of Health recommends an additional 450kcal/day during the first month, 530kcal/day during the second month and 570kcal/day during the third month to meet the needs of the growing baby. This should be met by maintaining a healthy diet and eating according to appetite (eg, eating small meals and snacks throughout the day).

About 11g of extra protein is required each day and while a healthy varied diet should be encouraged, milk and dairy foods and foods from the meat, fish, and pulses group deserve particular emphasis. Requirements for calcium, folate, vitamin A and vitamin C also increase significantly during lactation and increments in some other vitamins and minerals are recommended. Table 2 lists some of the vitamins and minerals for which reference nutrient intakes change during or after pregnancy.

Some of the foods which should be avoided in pregnancy (eg, soft cheese and paté) are safe during lactation because the infant is no longer in direct contact with the maternal blood supply. However, mothers should be aware that some foods and drinks can give the baby diarrhoea or colic, and such foods, once identified, are obviously best avoided. In addition, in families where there is a history of allergy (eg, asthma, hay fever, eczema or other allergies), peanuts and products containing them are best avoided.

Adequate intake of fluid is vital, and breastfeeding women should be encouraged to drink plenty of liquid and not to ignore thirst. The requirement for fluid should be obtained mainly from water, milk and fruit juice rather than tea and coffee. Alcohol should be limited, with current guidelines recommending no more than two units a day.

PRE- AND POST-NATAL VITAMINS

There are a few multivitamin and mineral preparations available, aimed at pregnant women. These tend to contain more folic acid, vitamin D, iron and calcium than standard products, and many do not contain vitamin A. For example, Sanatogen Pro-natal (Roche) contains seven minerals and 11 vitamins, including 700µg of folic acid in each one-a-day tablet. Another product, Pregnacare (Vitabiotics) contains 16 vitamins and minerals, with each tablet supplying 400µg folic acid. Pregnacare tablets also contain 3mg betacarotene, a precursor of vitamin A. Both these products can be used before, during and after pregnancy. However, they are not necessary if the woman has a balanced diet and takes her folic acid supplements as recommended.

action : practice points

1. Next time you are asked about ovulation test kits, make sure you also talk to the woman about the importance of a healthy diet.
2. Take a look at the supplements that you sell. Which can be safely recommended to a pregnant woman and why?
3. If necessary, revise your knowledge of anaemia. For example, take some time to read Martindale 33, pp715–6 or visit www.bsg.org.uk for guidelines for the management of iron deficiency anaemia.

evaluate

How could your learning have been more effective?
What will you do now and how will this be achieved?

TABLE 2: REFERENCE NUTRIENT INTAKES OF SELECTED NUTRIENTS FOR PREGNANT AND NON-PREGNANT WOMEN (19 TO 50 YEARS)

	Non pregnant	Pregnant	Lactation
A (µg/day)	600	700	950
D (µg/day)	0	10	10
Thiamine (mg/day)	0.8	0.9*	1.0
Riboflavine (mg/day)	1.1	1.4	1.6
Niacin (mg/day)	13	13	15
Vitamin B12 (µg/day)	1.5	1.5	2.0
Folate (µg/day)	200	300†	260
Vitamin C (mg/day)	40	50	70
Calcium (mg/day)	700	700	1250
Phosphorus (mg/day)	550	550	990
Magnesium (mg/day)	270	270	320
Copper (mg/day)	1.2	1.2	1.5
Zinc (mg/day)	7.0	7.0	13.0‡
Selenium (µg/day)	60	60	75

** For the last trimester only*
† A 400µg/day supplement should be taken from conception to the 12th week of pregnancy
‡ 9.5 mg for lactation after four months