



Healthy Pregnancy

10 Steps for a Healthy Pregnancy - a rationale

It is now well accepted that what happens during the very early years of life, and even before birth, influences the later health of the child. For that reason, preconception and pregnancy present a critical 'window of opportunity' to improve the health of the next generation.

During pregnancy the maternal diet must provide sufficient nutrients to meet the mother's usual requirements as well as those of the growing fetus, but in everyday life it can be difficult for women to focus on their own eating habits. Often they may be very busy working or looking after their family and might not have spare time to take good care of themselves.

For around half of the UK adult population, diets are too high in saturated fats and sugar. For some it is also low in essential micronutrients such as iron, folate and iodine. Modern lifestyles tend to involve less physical exercise and exposure to sunshine than in the past. This contributes to obesity and vitamin D deficiency.

Women are more likely to adopt healthier behaviours if they receive advice from health or childcare professionals, particularly before conception. It is for these reasons that better nutrition guidance in preconception and pregnancy should be considered a public health priority.

All health and childcare professionals who come into contact with women at different stages of motherhood share a key role in advising women who may be pregnant or planning a pregnancy. In order to embrace this role they need to have clear and practical guidance.

As an independent expert group who work together on child nutrition issues, we set out to review the existing evidence to define what constitutes healthy eating and lifestyle in pregnancy. We then created the 'Ten Steps' for a Healthy Pregnancy' - a summary of the evidence-base in the format of ten simple steps.

We thank many health and childcare professional bodies and expert medical reviewers who have helped in the development of this document and we will continue working with partners to ensure the widest dissemination to families.

ATUL SINGHAL Chairman of the Infant & Toddler Forum

How to use the Ten Steps for a Healthy Pregnancy

childcare professionals to advise women providing practical steps that all women

www.infantandtoddlerforum.org to order

Take a daily supplement

of 10µg vitamin D throughout pregnancy and 400µg folic acid up until at least the 12th week of pregnancy. Some women will be prescribed 5mg folic acid per day instead of 400µg

All but two nutrients - folate/folic acid and vitamin D - can be consumed in sufficient quantities by eating a wellbalanced, nutritious diet based on the five food groups in the Eatwell Plate. Dietary supplements of both folic acid and vitamin D are recommended during pregnancy by the National Institute for Health and Care Excellence (NICE) and the Scientific Advisory Committee on Nutrition (SACN).^{1,2,3,4}

Some pregnant women are entitled to free vitamin tablets containing both these vitamins under the Healthy Start scheme (www.healthystart.nhs.uk).

For other women there are several over-the-counter supplements suitable for pregnancy that contain both these vitamins, with or without a wider range of other nutrients. Foods fortified with these nutrients are available as an alternative supplement. As they provide additional energy (calories) they need to be part of the meals and snacks consumed.

Vitamin D

Supplementary vitamin D of 10µg per day is recommended throughout pregnancy and breastfeeding.¹ Maternal vitamin D deficiency increases the risk of vitamin D deficiency in the infant. Severe vitamin D deficiency in infants can cause hypocalcaemic seizures and cardiomyopathy in very young infants and rickets in older infants and toddlers.⁵ Deficiency also affects growth and development and one study reported lower bone density at nine years.⁶

The latest National Diet and Nutrition survey reported that, depending on the season, 10 to 40 per cent of women of child bearing age had low vitamin D status, particularly in late winter and

early spring.⁷ Non-caucasian pregnant women with darker skins are even more likely to have low levels of vitamin D.⁸

Increasing sun exposure on skin during the UK summer months – April to September – will increase vitamin D levels and stores. However, current lifestyles, use of sunscreen and modes of dress do not allow adequate vitamin D synthesis in all women. Oily fish is the only good dietary source of vitamin D, as the only other food sources (eggs, meat and some fortified foods) provide very small amounts.

Folic acid

Supplementary folic acid is needed prior to conception and up until 12 weeks gestation to lower the infant's risk of neural tube defects such as spina bifida.⁹ Low folate status in pregnant adolescents has also been found to increase the risk of having a small for gestational age baby.¹⁰

The Department of Health and NICE recommend a daily supplement of 400µg of folic acid to women preconceptually and until the 12th week of pregnancy. A higher dose of 5mg per day is prescribed for women whose infants are at higher risk of neural tube defects and these include mothers who:²

- tube defects
- tube defect have diabetes
- are obese

 have a neural tube defect or have a family history of neural tube defects have a partner who has a neural tube defect or has a family history of neural

have had a previous baby with a neural

10µg

of vitamin D is recommended per day

400µg

of folic acid is recommended per day until the 12th week of pregnancy



Keep physically active

throughout pregnancy, aiming for at least 30 minutes of moderate intensity activity on 5 or more days per week

Physical activity during pregnancy maintains fitness and may help prevent excess gestational weight gain¹¹ and the development of gestational diabetes.^{12,13}

UK guidance on physical activity for adults is:14

- at least 2 $\frac{1}{2}$ hours of moderate intensity aerobic activity such as cycling, swimming, gardening, dancing or fast walking every week, and
- muscle-strengthening activities on 2 or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders and arms). Examples include yoga, pilates or carrying shopping home.

This guidance also applies to healthy pregnant women who should aim to do this for as long as is comfortable. Those who did not exercise before pregnancy can slowly build up to this level.

Women who are usually more active than this can maintain their level of activity during pregnancy as long as they continue to find the activity level comfortable.¹⁵ During pregnancy women are likely to become fatigued more quickly.



NICE recommends:³



2.5 hrs moderate intensity activity per week

Pregnant women should be informed that beginning or continuing a moderate course of exercise during pregnancy is not associated with adverse outcomes. Pregnant women should be informed of the potential dangers of certain activities during pregnancy, for example, contact sports, high-impact sports and vigorous racquet sports that may involve the risk of abdominal trauma, falls or excessive joint stress, and scuba diving, which may result in fetal birth defects and fetal decompression disease.



BMI =

A healthy weight gain

during pregnancy depends on your pre-pregnancy weight and height. Expect to gain only 1-4 pounds (0.5-2kg) in the first trimester and the rest over the second and third trimesters

\frown	Excess or inadequate weigl during pregnancy are assoc
	poor health outcomes for b and infant. Being overweigh pregnancy, or excess gesta gain, increases the risk of g diabetes, pre-eclampsia, ca section, macrosomia and st They are also associated wi postpartum weight retention short, intermediate, and Ion as well as with future develo- obesity in children. ¹⁸ Glucos tests (GTT) are offered to w increased risk of developing diabetes, at around 28 wee
* BMI = weight in kg divided by the square of height in metres BMI = weight in kg	Gaining too little weight du pregnancy in women of no and those who are underwe result in infants being born birth weight, which is assoc short and long-term health in the child. ¹⁶
BMI = (height in m) ²	There are currently no UK ev recommendations on appro gain during pregnancy but t Institute of Medicine (IOM) r
Pre-pregnancy	Appropriate weight g

weight		e weight gail pregnancy
	pounds	kg
Normal weight *BMI = 18.5-24.9	25-35	11.5-
Overweight *BMI = 25-29.9	15-25	7-11
Obese *BMI greater than 30	11-20	5-9
Underweight *BMI less than 18.5	28-40	12.5-

ght gain ociated with both mother ght before ational weight gestational aesarean stillbirth.^{11,16} vith maternal ion in the ng term¹⁷ elopment of se tolerance women at ng gestational eks gestation.

uring ormal weight veight, can with a low ciated with n problems

evidence-based opriate weight the American recommends:19



Normally 0.5-2kg of weight is gained during the first trimester of pregnancy and the remainder of the recommended weight gain is expected during the second and third trimesters.

Although the IOM recommendations are based on observational data and some critics argue they may not suit all ethnic groups,²⁰ women who gain weight within the IOM ranges are more likely to have better maternal and infant outcomes than those who gain more or less weight.^{17,21,22}

Guidance on appropriate gestational weight gain and weight monitoring during pregnancy is not standard policy in the UK but studies have shown it to be feasible and well accepted.23 If introduced it could help prevent the poor health outcomes of excess gestational weight gain, particularly in those mothers who are overweight and obese.¹¹ In England in 2013 around 19 per cent of women of childbearing age were classed as obese and a further 29 per cent classed as overweight and would have been so at the start of a pregnancy.²⁴ NICE recommends that maternal obesity is best tackled before women become pregnant and a pregnant woman with a BMI over 30kg/ m² should be referred to a dietitian for assessment and advice on healthy eating and exercise.² In some areas of the NHS overweight and obese pregnant women are being offered support through intensive healthy lifestyle programmes which have limited gestational weight gain and resulted in positive outcomes.²¹ A Cochrane review showed similar outcomes¹¹ but two recent large randomised control trials only reported very modest overall outcomes.^{25,26}

Choose nutritious foods, not extra food

Extra energy (e.g. half a sandwich each day) is only needed during the last trimester

Requirements for some micronutrients are higher during pregnancy than for non-pregnant women, but extra energy from food is not needed during the first two trimesters.

Energy requirements depend on a woman's size, weight and activity levels. If a woman had a BMI within the normal range (18.5-25kg/m²) and was maintaining her weight before pregnancy then her energy requirement during the first and second trimesters of pregnancy will remain about the same as before pregnancy. She should continue to eat the same size meals as she did before pregnancy and definitely not increase her food intake and 'eat for two'. This is because changes in metabolic rate and a reduction in physical activity during the first two trimesters accommodate the small amount of extra energy to support the growth of the fetus and to enable fat to be deposited in the mother's body for use during lactation. The Department of Health recommends an extra 200 kcals per day from food for the final three months only.¹

Examples of food providing 200 kcals include:

- two slices of buttered bread
- a bowl of wholegrain breakfast cereal with milk
- a bowl of lentil and tomato soup and a bread roll
- $1/_2$ chicken and salad sandwich

A balanced diet with the recommended supplementation of vitamin D and folic acid will reduce the risk of nutrient deficiency and the associated poor health outcomes. However, most UK women of child bearing age would need to choose more nutritious food to meet the recommendations of higher intakes of key micronutrients during pregnancy. These are: thiamine, riboflavin, folate, vitamins A, C and D, calcium, phosphorus, magnesium, zinc, copper, selenium, iodine.27,28 and the essential omega 3 fatty acids.²⁹

The UK National Diet and Nutrition Survey reports that some UK women of childbearing age do not consume enough vitamins A and D, riboflavin, folate, iron, iodine, calcium, magnesium, potassium, zinc, and selenium to meet the recommendations⁷ and therefore do not meet the higher recommendations for pregnancy.

Additionally, blood samples from the same survey showed that about 10 per cent of women are anaemic.

Percentage of girls and women with low blood levels indicating iron deficiency anaemia⁷

Nutrient	Women 19-64 years	Teenage girls 11-18 years
Haemoglobin below 120g/L	9.9%	7.4%
Ferritin below 15 µg/L	15.5%	27.5%



fat and/or sugar

day if overweight.

This combination will provide all the nutrients required by pregnant women except for vitamin D and folate/folic acid which are required as supplements as discussed in step 1.

Recommended portion sizes and sample menus can be found in the Infant & Toddler Forum's Healthy Eating in Pregnancy Factsheet.³⁰ Some women may find different routines helpful, such as eating smaller meals often, to address heartburn and nausea at different stages in pregnancy.

Whole fruits are recommended in preference to fruit juices, which contain large amounts of the sugar fructose.

Base each meal and some snacks on these foods. Using wholegrain varieties will increase fibre intake to address constipation in susceptible women. Other starchy foods include breakfast cereals, crackers, crispbread, guinoa, couscous, and flour based foods such as scones.

Include one or more of these at each meal and aim for at least five

Three portions of milk, cheese or yogurt per day where one serving is 200-250ml milk/yogurt or 30g cheese. Use low fat varieties if overweight

Two servings a day or three for vegetarians. Include two servings of fish per week, at least one of which should be oily fish (e.g. salmon, mackerel, trout, herring, sardines). Eat a food high in vitamin C at the same time as eggs, nuts and pulses to enhance iron absorption from these foods.

Limit these to small quantities. These should not be eaten in place of the other four food groups. Limit them to about two or three small portions per

lodine in the UK diet comes mostly from cows' milk, cows' milk products and fish. Eggs provide small amounts. Non-dairy alternatives to milk such as milks based on soya, cereals or nuts contain only negligible amounts of iodine.

Women who do not eat fish and do not have three servings of cows' milk or cows' milk products such as, cheese or yogurt per day are unlikely to reach the WHO recommended intake of 250µg iodine per day.^{27, 31} The UK reference nutrient intakes (RNI) for pregnant women of 140µg/day of iodine has not been reviewed for many years and is now considered to be too low.³² Between 10-22 per cent of girls and young women in the UK have daily iodine intakes below both these figures⁷ and many meet the WHO definition of 'mild iodine deficiency'.³³ Maternal deficiency of iodine during pregnancy can damage a baby's brain development leading to permanent mental retardation.³⁴ Even minor levels of deficiency during pregnancy in the UK have been shown to reduce IQ levels in eight-year-old children.35

An over-the-counter supplement suitable for pregnant women providing 140-150mg/day is recommended for women who do not eat fish and have a low intake of dairy products.³⁶ Kelp and seaweed supplements should not be taken as these may contain very high levels of iodine which can cause thyroid problems.

Iron

Deficiency of this essential mineral can cause anaemia, tiredness and fatigue in the mother and increase the risk of low birth weight and anaemia in the baby.³⁷ Around 10 per cent of women of childbearing age have low haemoglobin levels, indicating iron deficiency,⁷ however women should now be screened for low iron levels early in pregnancy. NICE recommends iron supplements for women with haemoglobin levels below 110g/l in the first trimester of pregnancy and below 105g/l at 28 weeks gestation.3

Vegetarians

Although many vegetarian women's diets are significantly better than those of non-vegetarian women, vegetarian mothers who are at particular risk of poor nutrition include:

- adolescents, who have decided to avoid meat and other animal foods without taking care to ensure alternative sources of the nutrients found in meat
- ethnic groups who are not able to access culturally familiar foods

Before and during pregnancy, vegetarian women need to plan their diets carefully to ensure adequate intakes of iron, iodine, omega 3 fats, riboflavin, calcium and vitamin B₁₂. They can do this by:

- eating three servings per day of milk, cheese or yogurt
- eating three servings of fish, eggs, nuts and pulses per day to increase their iron intake and including a food high in vitamin C such as citrus fruit, kiwi fruit, tomatoes, pepper or potato at the same meal or snack
- including two servings of fish per week, at least one of which should be oily fish*

* If fish is not eaten, a supplement suitable for pregnancy containing both omega 3 fats and iodine should be taken.³⁰ Foods fortified with these nutrients are available as an alternative supplement. As they provide additional energy (calories) they need to be part of the meals and snacks consumed.

Vegans

Pregnant women who follow a vegan diet normally avoid all sources of animal foods including milk and milk products, eggs, meat and fish. They need to ensure that they consume sufficient:

- iodine by taking an over-the-counter supplement suitable for pregnancy providing 140-150µg per day (not kelp or seaweed supplements)
- vitamin B₁₂ from good sources such as fortified yeast extracts, fortified soya milk, fortified textured soya protein and fortified cereals. If these are not included in the diet a vitamin B₁₂

supplement may be needed calcium from fortified soya milk each day or taking a calcium supplement

- iron from good sources such as nuts, pulses and fortified breakfast cereals at the same time as a food high in vitamin C
- omega 3 fats from walnuts and walnut or rapeseed oil on a daily basis or consider taking an omega 3 supplement



with one or two servings as oily fish for omega 3 fats - if you don't eat fish take a daily supplement of 200mg DHA but avoid fish liver oil supplements

The omega 3 fatty acids docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) are essential fatty acids that are critical for brain development and vision during fetal development.³⁸ They can be synthesised from other omega 3 fatty acids and are actively transported to the fetus across the placenta during the second half of gestation. Consuming these two fatty acids in their pre-formed state from fish and supplements may benefit fetal development.³⁹

Fish considered safe to eat during pregnancy include thoroughly cooked shellfish and white fish such as cod. haddock and plaice. Sufficient amounts of omega 3 fats are provided when fish is eaten at least twice per week and one or two of these is oily fish such as salmon, mackerel, trout, herring, sardines.¹⁰ To ensure an adequate intake in women who do not eat fish, several expert bodies such as the European Food Safety Authority recommend a supplement of 100-200mg DHA per day in addition to the 250mg EPA + DHA per day that is recommended for all adults.^{29,40,41}

Better health outcomes from eating fish rather than taking omega 3 supplements have been reported.⁴² Increasing intake of the omega 3 short chain fatty acid alpha linolenic acid (ALA) can be achieved by using walnut and rapeseed oils in food preparation. Olive and soya oils contain less omega 3. Use of oils with very low omega 3 and very high omega 6 content, such as sunflower, corn, cottonseed and safflower oils should be minimized.³⁹

Suggestions that omega 3 supplementation during pregnancy reduces the incidence of preterm birth, remain unsubstantiated.43





TWICE a week to ensure omega 3 fats







Choose nutritious snacks

such as fruit, nuts, yogurt, a sandwich or toast rather than food or drink high in sugar or fat

To support the need for more nutrients during pregnancy, nutrient dense snacks are recommended in place of low nutrient density, high energy snacks such as crisps and similar packet snacks and chocolate bars. Recommended snacks include:

- Unsalted nuts with dried fruit
- Fresh fruit
- Vegetable sticks (e.g. carrot, cucumber, pepper, baby corn) and dips based on yogurt, cream cheese or hummus
- Wholegrain breakfast cereals with milk
- Cheese cubes and crackers or chapatti Sandwiches, bread rolls and pitta breads with fillings such as fish, egg, nut butters, cold meat along with salad or roasted vegetables
- French toast or toast with a range of spreads
- Slices of pizza with a plain dough base – not deep fried or pan fried
- Yogurt and fromage frais
- Crumpets, scones, currant buns, teacakes, scotch pancakes, fruit muffins
- Cakes and biscuits containing dried fruit, nuts or vegetables (e.g. fruit cake, carrot cake, date and walnut loaf)

Extra energy is only needed during the last trimester (e.g. an extra half a sandwich each day). Pregnant women should continue to eat the same size meals as before pregnancy and definitely not increase their food intake and 'eat for two'.





Nutrient dense snacks are recommended



 $(1\frac{1}{2}-2 \text{ litres})$ per day for good hydration - water is a good choice. Limit caffeine to 200mg per day (about 1 shot of espresso or 2 mugs of instant coffee or $2\frac{1}{2}$ mugs of tea)

Good hydration is important for maintaining maternal plasma osmolality and amniotic fluid volume. Fluid intake through drinks totalling 1½-2 litres per day is part of a well-balanced diet. Water is the best choice but all fluid counts.

Drinks that need to be limited are:

- High sugar drinks such as sweet drinks and fruit juices as these provide excess energy from their high sugar load
- Caffeinated drinks A limit of 200mg caffeine per day is currently recommended because high levels of caffeine may raise the risk of miscarriage or low birth weights.⁴⁴
- Herbal teas Little information is known about the effects of herbal teas on the fetus and as a precautionary measure NHS Choices suggest limiting these to a maximum of four cups per day.



brewed coffee

1 cup of tea

50g bar of plain

of milk chocolate



Food safety

Thoroughly cook meat, fish and eggs; wash all soil from vegetables and fruit and avoid vitamin A supplements, liver, liver pate, unpasteurised dairy products, soft and blue cheeses, swordfish, marlin and shark; limit tinned tuna to 4 small servings per week

Extra care with food hygiene needs to be taken during pregnancy because certain food-borne illnesses can cause miscarriage, stillbirth, and abnormalities in the developing fetus or severe illness in the newborn. These are:

Food-borne illness	Foods/materials to avoid
Listeriosis A flu-like illness caused by the bacteria, listeria monocytogenes	Pâté: meat, fish or vegetable unless tinned or pasteurised Mould ripened soft cheese (e.g. brie, camembert, blue-veined cheese) Unpasteurised milk and milk products Ready meals especially those containing chicken that are not heated thoroughly before consumption
Salmonella A bacteria which is the major cause of food poisoning in the UK	Raw or partially cooked eggs and foods containing them such as mayonnaise and mousse Undercooked poultry and other meat
Toxoplasmosis A disease caused by the parasite toxoplasma gondii found in raw meat, soil and cat faeces	Raw or undercooked meat Unpasteurised milk and milk products Soil Cat litter trays
Campylobacter A bacteria that commonly causes food poisoning in the UK	Undercooked poultry Unpasteurised milk and milk products Untreated water Soil Domestic pets

Precautions to take

- Avoid pâté and unpasteurised milk products
- Only eat soft cheeses if they have been cooked (e.g. blue-veined cheeses and soft cheeses with a white rind)
- Wash vegetables and salad thoroughly to remove any soil or dirt
- Only buy unwrapped foods (e.g. cooked meats and prepared salads) where scrupulous food handling guidelines have been followed as these foods can easily become contaminated
- Heat ready meals to piping hot right through; heat once only and discard the leftovers
- Cook eggs so that both the white and volk are solid
- Thoroughly cook all meat
- Defrost poultry in the fridge and cook until piping hot right through
- Only buy raw shellfish (e.g. prawns, cockles and mussels) if they are packaged and stamped with a use-by date and cook them thoroughly
- Wash hands after handling raw meat. fish or shellfish
- Wash hands after touching cats
- Wear rubber gloves when emptying cat litter trays
- Wear gloves while gardening
- Don't help with lambing or milking ewes that have recently given birth

Food safety continued...

Vitamin A

There are two dietary forms of vitamin A:

- retinol from animal sources (e.g. whole and semi-skimmed milk products)
- carotenoids from plant sources - particularly brightly coloured vegetables and fruit

Both forms are found in a healthy balanced diet and are important during pregnancy. However, high doses of retinol are associated with teratogenesis (malformations in the fetus).⁴⁵ To avoid high doses of retinol, pregnant women should eat a balanced diet but avoid:

- vitamin supplements containing retinol
- cod liver oil supplements and other fish oil supplements containing vitamin A
- liver and liver products such as liver pâté, as liver contains very high amounts of retinol

Oily fish should be eaten once or twice per week because this is a good source of omega 3 fats and iodine for both mother and her fetus. It should be limited to two servings per week because some of these fish contain dioxins and PCBs (polychlorinated biphenyls) that might affect the nervous systems of the fetus.46

Swordfish, marlin and shark should

be avoided due to possible high mercury levels.46

For the same reason **tuna** should be limited to four medium sized cans a week (with a drained weight of about 140g per can) or fresh tuna to two steaks (weighing about 140g when cooked or 170g raw).46

 Cooked shellfish, including prawns that are part of a hot meal and have been cooked thoroughly • Live or bio yogurt • Probiotic drinks • Fromage frais Crème fraîche

- Soured cream
- Spicy food
- avoided
- o hard cheese, such as
- o feta
- o ricotta
- o mascarpone
- o cream cheese
- o mozzarella
- o cottage cheese
- o paneer
- o halloumi







Foods considered safe to eat during pregnancy include:

• Mayonnaise, ice cream and salad dressing made with pasteurised egg. Home-made versions may contain raw eggs and must be

 Honey may be eaten during pregnancy, but is not suitable for infants until over 12 months of age Pasteurised cheeses including:

cheddar and parmesan

o processed cheese, such as cheese spreads



to stop smoking or misusing drugs or medication and avoid alcohol

Smoking during pregnancy increases the risk of miscarriage, stillbirth, premature birth, and sudden infant death syndrome.47

Using recreational drugs and/ or misusing medication during

pregnancy is associated with damage to the fetus and neonatal abstinence syndrome (NAS).48

The safest approach in pregnancy is not to drink alcohol at all, as recommended by the Chief Medical Officer's guidelines.⁴⁹ Alcohol in a mother's blood stream crosses the placenta into the blood stream of a fetus and results in nearly equal concentrations in the mother and fetus.

The evidence strongly supports avoidance of alcohol during the first trimester of pregnancy, as two units of alcohol per week during this trimester increases the risk of premature birth, and those drinking two or more units also have an increased risk of having a baby with a lower birth weight.50

Excess alcohol consumption during pregnancy (over 10 units per day) leads to fetal alcohol syndrome which includes diminished fetal growth, with intrauterine growth restriction and low birth weight babies who are often born with morphological abnormalities and impairment of the central nervous system leading to delayed neurodevelopment.⁵¹

Evidence of any harm from small amounts of alcohol during the

second and third trimesters is weak. NICE recommends that:³ 'If women choose to drink alcohol during pregnancy they should be advised to drink no more than one to two UK units once or twice a week (one unit equals half a pint of ordinary strength lager or beer, or one shot [25 ml] of spirits). Although there is uncertainty regarding a safe level of alcohol consumption in pregnancy, at this low level there is no evidence of harm to the unborn baby. Women should be informed that getting drunk or binge drinking during pregnancy (defined as more than five standard drinks or 7.5 UK units on a single occasion) may be harmful to the unborn baby."

Alcohol has a detrimental effect on the absorption and use of folate thus compounding the problem in women who do not take folic acid supplements.52

Units of alcohol	Alcoholic drinks
1	 Half a pint of ordinary strength beer, lager or cider (3.5% alcohol by volume (ABV)) 125ml glass of wine (9% ABV) 25ml measure of spirits (40% ABV)
1.5	125ml glass of wine (11% or 12% ABV)One bottle of alcopops
2	• 175ml glass of wine (11% or 12% ABV)

The Forum would like to thank the many health and childcare professional bodies and expert medical reviewers who have helped in the development of this document.

Dipti Aistrop

• Dr Sarah Bath

• Dr Susan Battersby

• Lisa Cooke

• Dr Robert Coombs

• Dr Catherine Hankey

• Dr Gill Harris

• Prof Simon Langle

Sarah Manuel

• Dr Rosan Meyer

• Judy More

• Tam Fry

• Gill Perks

Melanie Pilcher

The Infant & Toddler Forum CIC is committed to a world where every child has the healthiest start in life

Copyright rests with the Infant & Toddler Forum CIC

The following organisations have pledged their support:







Additional Resources:

Tommys www.tommys.org

Diabetes UK www.diabetes.org.uk/gestational

References:

1 Department of Health. Dietary Reference Values for Food Energy and Nutrients for the UK. Report No 41. Report of the Panel on Dietary Reference Values of the Committee on Medical Aspects of Food Policy. HMSO, London. 1991.

2 National Institute for Health and Care Excellence. Public Health Guidance 11. Improving the nutrition of pregnant and breastfeeding mothers and children in low income households. 2008.

3 National Institute for Health and Care Excellence. Clinical Guidance 62. Antenatal care. 2008.

4 Scientific Advisory Committee on Nutrition. The influence of maternal, fetal and child nutrition on the development of chronic disease in later life. 2011.

5 Mulligan ML, Felton SK, Riek AE, Bernal-Mizrachi C. Implications of vitamin D deficiency in pregnancy and lactation. Am J Obstet Gynecol. 2010 May; 202(5): 429.e1-429.e9.

6 Javaid MK, Crozier SR, Harvey NC, Gale CR, Dennison EM, Boucher BJ et al. Maternal vitamin D status during pregnancy and childhood bone mass at age 9 years: a longitudinal study. Lancet. 2006;367, 36-43.

e y-Evans f Biosciences trition, Faculty Nottingham	• Prof Margaret Rayman Professor of Nutritional Medicine, Department of Nutritional Sciences, University of Surrey
ation Manager,	• Prof Rebecca Reynolds Professor of Metabolic Medicine, Centre for Cardiovascular Science, University of Edinburgh
arch Dietitian, Great	 Prof Atul Singhal Professor of Paediatric Nutrition, Institute of Child Health, UCL
London	• Sara Stanner Science Director, British Nutrition Foundation
besity Forum	• Carolyn Taylor Specialist Practice Teacher, Health Visiting, Chair and CPHVA Executive
rlotte's & Chelsea Healthcare	• Alison Wall Independent Health Visitor/Public Health Adviser



7 National Diet and Nutrition Survey: Results from Years 1-4 (combined) of the Rolling Programme (2008/2009 - 2011/12) Executive summary. 2014.

8 Datta S, Alfaham M, Davies DP, Dunstan F, Woodhead S, Evans J et al. Vitamin D deficiency in pregnant women from a non-European ethnic minority population--an interventional study. BJOG. 2002;109:905-08

9 Milunsky A, Jick H, Jick SS, Bruell CL, MacLaughlin DS, Rothman KJ, et al. Multivitamin/ folic acid supplementation in early pregnancy reduces the prevalence of neural tube defects. JAMA. 1989;262(20):2847-52

16 // Healthy Eating In Pregnancy

10 Baker PN, Wheeler SJ, Sanders TA, Thomas JE, Hutchinson CJ, Clarke K, et al. A prospective study of micronutrient status in adolescent pregnancy. Am J Clin Nutr. 2009;89:1114-24.

11 Muktabhant B, Lawrie TA, Lumbiganon P, Laopaiboon M. Diet or exercise, or both, for preventing excessive weight gain in pregnancy. Cochrane Database Syst Rev. 2015 Jun 11;6:CD007145. [Epub ahead of print]

12 Russo LM, Nobles C, Ertel KA, Chasan-Taber L, Whitcomb BW. Physical activity interventions in pregnancy and risk of gestational diabetes mellitus: a systematic review and meta-analysis. Obstet Gynecol. 2015;125(3):576-82.

13 Sanabria-Martínez G, García-Hermoso A, Poyatos-León R, Álvarez-Bueno C, Sánchez-López M, Martínez-Vizcaíno V. Effectiveness of physical activity interventions on preventing gestational diabetes mellitus and excessive maternal weight gain: a meta-analysis. An International Journal of Obstetrics & Gynaecology. 2015. Jun 3. doi: 10.1111/1471-0528.13429. [Epub ahead of print]

14 Department of Health. Physical Activity Guidelines for Adults (19-64 years). 2011

15 NHS Choices. How much weight will I put on during my pregnancy? Available from http://www.nhs.uk/chq/Pages/2311. aspx?CategoryID=54&SubCategoryID=131 [Accessed Aug 2015].

16 Berti C, Cetin I, Agostoni C, Desoye G, Devlieger R, Emmett PM, et al. Pregnancy and infants' outcome: nutritional and metabolic implications. Crit Rev Food Sci Nutr. 2014.

17 Viswanathan M, Siega-Riz AM, Moos MK, Deierlein A, Mumford S, Knaack J et al. Outcomes of Maternal Weight Gain. Rockville (MD) Agency for Healthcare Research and Quality (US). 2008. Report number: 08-E009.

18 Herring SJ, Rose MZ, Skouteris H, Oken E. Optimizing weight gain in pregnancy to prevent obesity in women and children. Diabetes Obes Metab. 2012; 14(3):195-203.

19 Institute of Medicine. Report Brief: Weight Gain During Pregnancy, Reexamining the Guidelines. 2009.

20 Poston L, Harthoorn LF, Van Der Beek EM. Obesity in pregnancy: implications for the mother and lifelong health of the child. Pediatr Res. 2011 Feb;69(2):175-80.

21 McGiveron A, Foster S, Pearce J, Taylor M.A, McMullen S, Langley-Evans S.C. Limiting antenatal weight gain improves maternal health outcomes in severely obese pregnant women: findings of a pragmatic evaluation of a midwife led intervention. J Hum Nutr Diet. 2015; 28 (Suppl. 1), 29–37.

22 Asvanarunat E. Outcomes of gestational weight gain outside the Institute of Medicine Guidelines. J Med Assoc Thai. 2014 Nov;97(11): 1119-25.

23 Daley A, Jolly K, Lewis A, Clifford S, Kenyon S, Roalfe AK. The feasibility and acceptability of regular weighing of pregnant women by community midwives to prevent excessive weight gain: RCT. Pregnancy Hypertens. 2014 Jul;4(3):233-4.

24 Health and Social Care Information Centre. Health Survey for England 2013. 2014.

25 Dodd JM, McPhee AJ, Turnbull D, Yelland LN, Deussen AR, Grivell RM et al. The effects of antenatal dietary and lifestyle advice for women who are overweight or obese on neonatal health outcomes: the LIMIT randomised trial. BMC Med. 2014 Oct 13;12:163.

26 Poston L, Bell R, Croker H, Flynn AC, Godfrey KM, Goff L et al. Effect of a behavioural intervention in obese pregnant women (the UPBEAT study): a multicentre, randomised controlled trial. Lancet Diabetes Endocrinol. 2015 Oct;3(10):767-77.

27 World Health Organization. Assessment of lodine Deficiency Disorders and Monitoring Their Elimination. 2nd edn. 2007. Geneva.

28 Delange F. lodine requirements during pregnancy, lactation and the neonatal period and indicators of optimal iodine nutrition. Public Health Nutrition. 2007;10:1571–1580.

29 Koletzko B, Cetin I, Brenna JT. Dietary fat intakes for pregnant and lactating women. British Journal of Nutrition. 2007;98:873-877.

30 Infant & Toddler Forum. Healthy Eating in Pregnancy Factsheet. 2014.

31 Bath SC, Sleeth ML, McKenna M, Walter A, Taylor A, Rayman MP. lodine intake and status of UK women of childbearing age recruited at the University of Surrey in the winter. Br J Nutr. 2014: 112(10), 1715-1723.

32 Bath SC, Walter A, Taylor A, Wright J, Rayman MP. Iodine deficiency in pregnant women living in the South East of the UK: the influence of diet and nutritional supplements on iodine status. Br J Nutr. 2015;111(9), 1622-1631 15.

33 Vanderpump MPJ, Lazarus JH, Smyth PP, Laurberg P, Holder RL, Boelaert K, et al. Iodine status of UK schoolgirls: a cross-sectional survey. Lancet. 2011; 11:377(9782):2007–12.

34 Skeaff S. lodine Deficiency in Pregnancy. Nutrients. 2011; 3(2): 265-273.

35 Bath SC, Steer C, Golding J, Emmett P, Rayman MP. Inadequate iodine status in UK pregnant women adversely affects cognitive outcomes in their children: results from the Avon Longitudinal Study of Parents and Children (ALSPAC). Lancet. 2013 382, p331-337
36 British Dietetic Association. Food Fact Sheet Iodine. May 2013.

37 Alwan NA, Cade JE, McArdle HJ, Greenwood DC, Hayes HE, Simpson NA. Maternal iron status in early pregnancy and birth outcomes: insights from the Baby's Vascular health and Iron in Pregnancy study. Br J Nutr. 2015:6:1-8.

38 Coletta JM, Bell SJ, Roman AS. Omega-3 Fatty Acids and Pregnancy Rev Obstet Gynecol. 2010; 3(4): 163–171

39 Greenberg JA, Bell SJ, Ausdal WV. Omega-3 Fatty Acid supplementation during pregnancy. Rev Obstet Gynecol. 2008;1(4):162–9.

40 Koletzko B, Lien E, Agostoni C, Böhles H, Campoy C, Cetin I et al. The roles of long-chain polyunsaturated fatty acids in pregnancy, lactation and infancy: review of current knowledge and consensus recommendations. J Perinat Med. 2008. 36:5-14.

41 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). Scientific Opinion on Dietary Reference Values for fats, including saturated fatty acids, polyunsaturated fatty acids, monounsaturated fatty acids, trans fatty acids, and cholesterol. EFSA Journal 2010; 8(3):1461.

42 Oken E, Belfort MB. Fish, fish oil, and pregnancy. JAMA. 2010;304:1717-8

43 Saccone G, Berghella V. Omega-3 long chain polyunsaturated fatty acids to prevent preterm birth: a systematic review and meta-analysis. Am J Obstet Gynecol. 2015 Mar 7. pii: S0002-9378(15)00208-2. [Epub ahead of print]

44 Food Standards Agency. High caffeine energy drinks and other foods containing caffeine. 2008.

45 Department of Health. Women cautioned: Watch your vitamin A intake. Department of Health Press Release No 90/507. 1990. London

46 NHS Choices. Foods to Avoid in Pregnancy. 2014. Available from http://www.nhs.uk/ conditions/pregnancy-and-baby/pages/foods-toavoid-pregnant.aspx#close. [Accessed Aug 2015].

47 Fleming P, Blair PS. Sudden Infant Death Syndrome and parental smoking. Early Human Development. 2007;83:721-725.

48 Jansson LM, Velez M. Neonatal abstinence syndrome. Curr Opin Pediatr. 2012 Apr;24(2):252-8.

49 Department of Health. UK Chief Medical Officers' Alcohol Guidelines Review. January 2016.

50 Nykjaer C, Alwan NA, Greenwood DC, Simpson NAB, Hay AWM, White KLM et al. Maternal alcohol intake prior to and during pregnancy and risk of adverse birth outcomes: evidence from a British cohort. J Epidemiol Community Health. 2014;68:542–549.

51 O'Leary CM. Fetal alcohol syndrome: Diagnosis, epidemiology, and developmental outcomes. J Paed Child Health. 2004. 40, 2-7.

52 Feltes BC, de Faria Poloni J, Nunes IJ, Bonatto D. Fetal alcohol syndrome, chemo-biology and OMICS: ethanol effects on vitamin metabolism during neurodevelopment as measured by systems biology analysis. OMICS. 2014. 18(6):344-63.