BRADFORD
working in partnership

NHS

Every Baby Matters

Guidelines for good nutrition in Bradford and Airedale
Nutrition and pregnancy

INTRODUCTION

Pregnancy needs and uses a large amount of energy and nutrients. Foetal development is sensitive to nutrient balance and deficiencies particularly during the first 3 months of pregnancy as this is a critical period for brain and vital organ development. There is increasing evidence that nutritional status and intake at conception and through pregnancy can affect a child's future development and long term health.

During pregnancy, nutrient supply to the developing baby is influenced by:

- natural adaptation of the mother's absorption and metabolism of nutrients from food to nourish the baby
- how well nutrients cross the placenta and are taken up by the baby
- any maternal nutrient losses and deficiencies
- changes in maternal food choices and dietary intake.

A balanced diet and good nutritional status prior to conception and throughout pregnancy will ensure that the nutritional demands of pregnancy are met and help improve the chances of a successful pregnancy and healthy mum and baby.

Because of the natural adaptation that the body can make for pregnancy many of the extra nutritional demands can usually be met by following the principles of healthy eating recommended for the general population together with advice for some additional dietary issues which arise in pregnancy.

Detailed and practical advice about the five food groups and how to eat a healthy diet can be found in the Live Well section of the NHS choices website www.nhs.uk/Livewell and www.nhs.uk/Livewell/Goodfood/Pages/Healthyeating.aspx

The guidelines below give current, evidence-based information and practical advice about some specific additional food and dietary considerations for women who are pregnant. These include:

- additional energy and protein requirements
- specific needs of vegetarian or vegan mothers
- nutrients to pay attention to vitamin D, calcium, iron, folic acid and essential supplements
- food safety issues in pregnancy; vitamin A rich foods and supplements, alcohol, caffeine, peanuts and fish
- food borne illness and infections
- weight management in pregnancy.

There is also information about:

- managing common problems in pregnancy e.g. nausea and vomiting, constipation, indigestion & heartburn, food aversions and cravings
- groups and individuals who may be at increased nutritional risk - to assist with targeting interventions and support.

Prepared by Bradford Nutrition and Dietetics Service
01274 783126/365387

ENERGY NEEDS IN PREGNANCY (calories or kcals)

No extra energy intake is needed for pregnancy until the last 3 months. An **additional 200 kcals** is needed from the **beginning of the 7th month** of pregnancy. Most women, however, can meet this through changes in appetite and due to a reduction in overall physical activity as pregnancy progresses. Women who are underweight (BMI <20) at the beginning of pregnancy and who maintain their activity levels may need more than 200 kcals per day.

The following are approximately 200kcals each:

- 1 medium croissant
- 200g of creamed tinned soup (1/2 can)
- 2 slices of bread
- 2 chocolate digestives
- 1 banana and 1 apple
- 1 glass of semi skimmed milk and 1 pot of yoghurt.

PROTEIN NEEDS IN PREGNANCY

An extra 6g of protein a day is recommended from the beginning of pregnancy. However, most women eat more protein than this extra amount daily, so it is unlikely the majority would need to actively eat more.

Special consideration should be given to vegetarian and vegan women to ensure they have adequate and varied sources of protein in their diet.

Vegan Protein Sources	**Vegetarian** protein sources
beans, pulses and lentils tofu tempeh nuts and seeds soya mince soya milk soya cheese soya yoghurt textured vegetable protein	All vegan sources plus: - cheese - milk - eggs - yoghurt - mycoprotein (Quorn)

Strict vegans avoid any animal products and vitamin B12 is not found in any plant foods. It is therefore important that vegan diets should contain vitamin B12 fortified foods
e.g. Barmene or Tastex, Marmite, Vegemite (yeast extracts), fortified soya milk, fortified rice milk, fortified textured soya protein and fortified breakfast cereals.

A Vitamin B12 supplement is recommended for pregnant women following a vegan diet who do not regularly include these foods to ensure an adequate intake.

VITAMIN D

Vitamin D is needed for the absorption of calcium during pregnancy, both of which are essential for normal tooth and bone development. A significant proportion of the population have low vitamin D levels which has resulted in a rising number of cases of rickets and other disorders caused by vitamin D deficiency. Pregnant women need good vitamin D levels to ensure there is enough for the developing babies needs, and to prevent disorders related to vitamin D deficiency in both the baby and themselves.

Normally, the body relies on sunlight exposure to meets its vitamin D requirements and women should be encouraged to regularly expose skin in the spring and summer months for short periods of time to sunlight without sunscreen. Skin should always be protected before it starts to redden and burn. The darker the skin, the more exposure needed but all skin types should take great care not to burn.

Foods containing vitamin D naturally (e.g. fortified margarine, egg yolk, fortified breakfast cereal, oily fish and evaporated milk) should be encouraged but be aware that it is difficult to obtain enough vitamin D from diet alone.

All women are advised to take a supplement of 10 mcg of vitamin D daily during pregnancy and to continue until they stop breastfeeding. Advice should be provided on the Healthy Start Scheme vitamins for women (low-cost or free vitamins, and vouchers for milk, fruit and vegetables from the 10th week of pregnancy). For further information see www.healthystart.nhs.uk

Women who are at increased risk of low Vitamin D levels include:

- from black and minority ethnic backgrounds who have darker pigmented skin
- housebound
- teenagers
- those with poor nutritional status and diet restricted to certain food groups (eg vegans and vegetarians)
- women who have closely spaced pregnancies
- breastfeeding mothers
- those whose skin is covered /strict sunscreen use
- Women taking certain drug therapies e.g. anti-convulsants or with liver/kidney disease.

CALCIUM

Calcium is essential for foetal bone formation. No extra calcium is needed during pregnancy. A daily intake of 700 mg is advised and this can be achieved by including 2-3 portions of dairy foods in the diet daily.

There may be some at risk women who may need calcium supplementation. They include:

- teenagers (particularly younger ones)
- underweight
- poor dairy intake
- eating disorders/disordered eating behaviour
- coeliac condition, Crohn's disease or other malabsorption conditions
- black and minority ethnic backgrounds.

It is important that women from these groups are offered appropriate dietetic advice and are advised on adequate intake and good sources of calcium in the diet as well as supplements.

IRON

Iron is needed to make maternal and foetal red blood cells which carry oxygen into the muscles. The foetus lays down most of its iron in the last 3 months of pregnancy and these stores last for about 4-6 months after birth. A daily intake of 14.8mg of iron is advised for women of childbearing age. During pregnancy, the body adapts to increase the absorption of iron providing that dietary intake of iron is sufficient.

A daily intake of **2-3 portions of iron rich foods** can meet this demand and meat, poultry, iron-fortified breakfast cereals, eggs, pulses, green leafy vegetables, nuts, wholegrains, soya products and dried fruit should be included regularly in the diet. Iron absorption in the gut is improved in the presence of vitamin C. Foods and drinks rich in vitamin C (e.g. fruit and fruit juices, potatoes, vitamin C fortified squash, salad, vegetables) should be eaten at the same meal.

There may be some women who are at a greater risk of developing iron deficiency anaemia during pregnancy. They include:

- those with prolonged poor dietary intake
- a history of anaemia
- closely spaced pregnancies
- teenagers
- vegetarians and vegans.

Foods and drinks containing tannin like substances (tea, coffee, chocolate, herbal teas, red wine and beer) should be avoided at the same meal as these greatly reduce the amount of iron absorbed.

FOLIC ACID

Folic acid is very important for brain development during the early stages of pregnancy and helps protect against spina bifida and other neural tube defects.

Women are advised to take a folic acid supplement of **400 mcg *daily as a supplement until the end of the 12th week of pregnancy** to prevent spina bifida and neural tube defects. During pregnancy, folic acid needs increase and these needs can be met by advising a balanced and varied diet, which includes good food sources of folic acid (eg fortified breakfast cereals, green leafy vegetables, yeast extracts).

Advice should be provided on the Healthy Start vitamins for women, (which contain 400mcg of folic acid). Some women will qualify for free vitamins.

*There are some women who are at greater risk of developing spina bifida and other neural tube defects. **Women who have a history of neural tube defects or spina bifida in their family, take anti convulsant medication, or who have diabetes, coeliac condition, Crohn's disease or other malabsorption conditions are advised to take a folic acid supplement of 5mg daily until the end of the 12th week of pregnancy.**

Should obese women take a higher dose folic acid supplement?
Obese women have a higher risk of a baby with neural tube defects (NTD). Some studies have shown that obese women have lower levels of folate in their blood. However the effectiveness of the higher dose in reducing risk of NTD in obese women has not yet been established (there may be additional causes of NTDs in this group e.g. undiagnosed diabetes). Uptake of supplements is poor for even the general 400microgram supplement recommended for all women pre-pregnancy. There is currently debate about whether this whole population group (i.e. all obese women who may become pregnant) should be recommended to take the higher daily dose of 5 mg folic acid supplementation. The Scientific Advisory Committee on Nutrition (SACN) has reviewed the evidence (Sept 2010) and has reiterated the recommendation that all women who could become pregnant should take a daily 400 microgram supplement, and that efforts to improve compliance throughout the population should be continued. Women with a high BMI may be advised by those responsible for their individual clinical care to take the higher dose when planning a pregnancy or pregnant according to their individual requirements.

VITAMIN A
Most women in the UK can meet their needs for vitamin A by eating a balanced diet which includes milk and milk products, fortified margarine, oily fish, dairy products, eggs and orange vegetables. Very high intakes of vitamin A in the diet may increase the risk of birth defects.

Liver and liver products (pate, sausage), fish oils and fish liver oils, vitamin supplements containing vitamin A should be avoided throughout pregnancy except on the advice of a doctor, pharmacist or dietitian.

ALCOHOL
Alcohol is a toxin and if drunk during pregnancy it can cause permanent damage to the foetus, causing problems from mild learning difficulties through to significant birth defects such as foetal alcohol spectrum disorders. It can also cause miscarriage or premature birth.

It is advisable to avoid alcohol consumption during pregnancy and especially during the first 3 months of pregnancy or to limit intake to 1-2 units once or twice a week.

FISH
Fish are a good source of protein and essential fatty acids. Fish including oily fish should be included as part of a varied and balanced diet. There is increasing evidence that eating fish in pregnancy may be beneficial to child development. However, some types of large fish and oily fish need to be avoided or limited during pregnancy due to levels of pollutants they may contain.

Shark, marlin and swordfish need to be avoided completely. Intake of tuna needs to be limited to 2 fresh steaks or 4 medium cans per week. All other oily fish should be limited to 2 portions per week (sardines, pilchards, salmon, trout, herring or mackerel).

Type	Safe Limit
marlin, shark and swordfish	Avoid
fresh tuna/other oily fish	twice a week **OR**
tinned tuna	4 medium tins a week

Sushi and any other dishes made from raw fish can be eaten during pregnancy, provided the fish used is frozen first. Most sushi sold in shops and restaurants is generally safe to eat.

Raw shellfish may be contaminated with harmful parasites, bacteria or viruses that can cause food poisoning which could harm the baby. Shellfish must be stored and prepared safely and cooked thoroughly before eating.

CAFFEINE

Caffeine intake needs to be limited to 200mg per day. Intakes of more than this in pregnancy can lead to miscarriage, low birth weight babies and complications during labour.

200mg of caffeine is found in each of the following;

- 2 mugs of instant coffee
- 1 mug of filter coffee
- 2 mugs of tea
- 5 cans of cola
- 2 cans of "energy" drink
- 4 (50g) bars of dark/plain chocolate

Caffeine is also found in certain cold and flu remedies and should only be taken as advised by a doctor or pharmacist.

PEANUTS

There is there is no clear evidence that eating or not eating peanuts during pregnancy, influences the chances of a child developing a peanut allergy. Current government advice is that peanuts need only be avoided if the mother herself has a peanut allergy.

FOOD BORNE ILLNESSES AND INFECTIONS

Some types of food borne infections pose a particular threat to pregnant women, as they can cause miscarriage or damage to the foetus. It is important food is prepared well, cooked thoroughly and if reheated, that it is piping hot throughout before eating. Take special care to follow the storage instructions on food labels. Your fridge should be between 0°C and 5°C – and chilled foods should be kept out of the fridge for the shortest time possible. Don't use food after its 'use by' date.

LISTERIOSIS

Listeriosis is caused by a bacterium and if caught during pregnancy, it can cause miscarriage, stillbirth or a very ill baby.

Pregnant women should avoid:

- soft, ripened cheeses (camembert, brie, goats and sheep cheeses, soft blue veined cheeses)
- un-pasteurised milk and milk products
- pate.

SALMONELLOSIS

Salmonellosis is caused by a bacterium and if caught during pregnancy, can lead to miscarriage or premature labour.

All pregnant women should avoid raw or partially cooked eggs, undercooked meats, and poultry, pate and raw shellfish. Ensure all food is cooked thoroughly or reheated
until it is piping hot throughout, before eating.

TOXOPLASMOSIS
Toxoplasmosis is caused by a parasite and is commonly found in raw meat, unpasteurised milk, soil or cat faeces. If caught during pregnancy it can be harmful to the foetus.

Pregnant women should eat meat and chicken which has been cooked thoroughly, avoid un-pasteurised milk and milk products and follow strict hygiene standards (wear gloves, wash hands thoroughly etc) if gardening or handling cat litter.

CAMPYLOBACTERIOSIS
Campylobacteriosis is caused by a bacterium and is one of the common causes of food poisoning. If caught during pregnancy it can increase the risk of spontaneous abortion, stillbirth or pre-maturity.

Pregnant women should avoid undercooked meat or poultry, un-pasteurised milk and milk products, untreated surface water, domestic pets and soil. The risk is greatly reduced by observing good hygiene practices.

WEIGHT MANAGEMENT DURING PREGNANCY
If a pregnant woman is obese this will have a greater influence on her health and the health of her baby than the amount of weight she may gain during pregnancy. Obesity increases the risk of foetal malformation, miscarriage, eclampsia, high blood pressure, gestational diabetes and complications during pregnancy, labour and birth.

For this reason it is important to help women lose weight if needed **before and between pregnancies.**

Dieting (i.e. restrictive diet aimed at weight loss) is not recommended during pregnancy as it may harm the health of the unborn child.
The amount of weight a woman may gain in pregnancy can vary a great deal.
Pregnancy weight gain is due to:

- increased body fat and protein stores being laid down in the mother for breast milk production
- increased blood volume
- foetus weight
- amniotic fluid and placenta.

Practical advice on healthy eating and appropriate physical activity should be provided.

See appendix 1 for more information about national NICE guidance that should be followed regarding weight management before, during and after pregnancy including a summary of key principles about:

- ***achieving and maintaining a healthy weight***
- ***effective weight loss programmes***
- ***evidence based behaviour change advice.***

Recommended weight gain during pregnancy

There are no evidence-based UK guidelines on recommended weight gain ranges during pregnancy. There is some guidance available in the US (US National Academy of Science 2009) which suggests total weight gain ranges during pregnancy for US women based on pre-pregnancy BMI and this is shown below for interest. Most weight gain will be in the 2nd and 3rd trimester of pregnancy.

Body Mass Index	Weight Gain (single pregnancy)
<18.5	12.5-18 kg
18.5-24.9	11.5-16kg
25-29.9	7-11.5kg
>30	5-9kg

Health professionals and practitioners caring for the pregnant woman should:

- provide advice on general healthy eating, portion sizes, low fat food choices and healthier methods of cooking and appropriate physical activity
- offer women with a BMI of 30 or more at the booking appointment a referral to a dietitian or appropriately trained health professional for assessment and personalised advice on healthy eating and how to be physically active.
- encourage them to lose weight after pregnancy.

Note that teenagers BMI should be interpreted using an appropriate BMI centile chart as the definitions of overweight and obesity in the table apply to adults. Teenagers even if obese have higher requirements of many nutrients as they are still developing themselves.

PREGNANCY RELATED PROBLEMS

NAUSEA AND VOMITING

Nausea and/or vomiting (morning sickness) commonly effects most women during pregnancy, particularly in the first 3 months of pregnancy. In a small group of women, nausea and vomiting can be severe, known as **hyperemesis gravidium** and needs specialist advice and management.

Morning sickness can be worsened by travelling, smells and food preparation. Pregnant women should be advised on the following measures to try and manage their symptoms without compromising nutritional intake:

- frequent, high complex carbohydrate snacks (toast, breakfast cereal, sandwich, crackers, crisp bread).
- eating some dry bread, plain biscuits or cereal before getting out of bed. When getting out of bed, to do so slowly and avoid sudden movements.
- drinking small amounts of fluid, preferably in between meals to avoid abdominal distension which can trigger vomiting.
- avoid large meals, high fat or spicy foods.
- sucking sour foods, like lemon or sharp boiled sweets.
- sipping a fizzy drink slowly if nauseous.
- having food or drink containing ginger (ginger biscuits, non-alcoholic ginger beer).

CONSTIPATION

Constipation is a common problem associated with pregnancy especially during the last trimester. Reasons include:

- decrease in physical activity
- reduced fluid intake /increased fluid requirements in pregnancy
- dietary changes
- foetus pressing down on the large bowel.

Dietary advice can prevent and help manage constipation by encouraging high fibre foods together with plenty of fluids.

- **aim for at least 8 cups of fluid a day.**
- **high fibre foods include**
  - wholegrain breads, breakfast cereals and flours (eg for chappatis)
  - brown rice and pasta
  - beans, dahls, peas, lentils and other pulse vegetables
  - fruit and vegetables.

INDIGESTION AND HEARTBURN

Indigestion and heartburn effects most women during pregnancy, but more so in the last trimester. It is not uncommon for mild to moderate antacid remedies to be prescribed to manage these symptoms.

Dietary modification can help manage indigestion and heartburn symptoms:

- smaller, balanced meals and snacks should be advised
- avoid highly seasoned or spicy foods and fizzy drinks if these trigger symptoms
- milk and yoghurt can help in relieving symptoms for some women
- practical advice on wearing loose fitting clothes, avoiding lying down
- after eating and raising the bed at the head may also be of benefit.

FOOD AVERSIONS AND CRAVINGS

Food aversions and **cravings** are seen in many pregnant women. Common food aversions include tea, coffee, alcohol, fried foods and meat. **Pica** is the craving for substances which are not usually food based or fit for human consumption. Common substances ingested are clay, chalk, ice and paper. If food aversions, craving and pica are displayed, ongoing dietary assessment should be carried out to make sure main food groups are not avoided, and the diet remains varied and balanced. Substances ingested should be limited, non toxic and should not replace meals or snacks.

WHO MAY BE AT PARTICULAR NUTRITIONAL RISK DURING PREGNANCY?

- Some pregnant women will be particularly vulnerable to nutritional deficiency, have increased requirements or other needs. They should be identified and appropriate dietary interventions /advice offered including support from a dietitian where more individualised or specialist advice is needed. These include:

- teenagers – particularly young teens (teenagers have higher nutritional requirements than adults as they are still developing themselves)
- underweight (BMI under 18.5) or obese women (BMI over 30) (note that for under 18 yr olds BMI centile charts should be used to interpret BMI)
- excessive/poor weight gain during pregnancy
- black and minority ethnic groups
- low income
- vegetarians and vegans
- eating disorders
- substance abuse – drugs, alcohol
- pre existing medical condition requiring dietary management eg diabetes, coeliac conditions, PKU, food allergy, Crohns and malabsorption conditions
- closely spaced pregnancies or those with poor obstetric history, including previous low birth weight babies.

KEY SOURCES AND RESOURCES

Feig, DS, Naylor, CD. Eating for two: are guidelines for weight gain during pregnancy too liberal? Lancet1998; 351: 1054-1055

Weight Gain During Pregnancy: Reexamining the Guidelines 2009 Kathleen M. Rasmussen and Ann L. Yaktine, Editors; Committee to Reexamine IOM Pregnancy Weight Guidelines; Institute of Medicine; National Research Council http://www.nap.edu/catalog/12584.html

Thomas, Briony and Bishop, Jackie. Manual of Dietetic Practice, Fourth Edition, 2007. Blackwell Publishing

NICE Clinical Guideline 62 – Antenatal Care – Routine Care of the Healthy Pregnant Woman. March 2008 http://guidance.nice.org.uk/CG62

NICE Public Health guidance 11 -Improving the nutrition of pregnant and breastfeeding mothers and children in low-income households March 2008 www.nice.org.uk/PH011

NICE Public Health Guidance 27 -Dietary interventions and physical activity interventions for weight management before, during and after pregnancy July 2010 www.nice.org.uk/guidance/PH27

Scientific Advisory Committee on Nutrition (SACN), Committee on Toxicity (COT). Advice on fish consumption: benefits and risks. 2004 http://www.sacn.gov.uk/pdfs/fics_sacn_advice_fish.pdf

Scientific Advisory Committee on Nutrition (SACN) Update on Vitamin D Position Statement 2007 http://www.sacn.gov.uk/pdfs/sacn_position_vitamin_d_2007_05_07.pdf

Scientific Advisory Committee on Nutrition (SACN) Draft report: The influence of Early Life Nutrition on later Chronic Disease Risk. February 2010 www.sacn.gov.uk

Scientific Advisory Committee on Nutrition, Background papers and minutes. of the 14th meeting of the subgroup on maternal and child nutrition. 8 September 2010 (concerned with CMACE/RCOG recommendations (March10) on higher dose folic acid supplements for obese women) http://www.sacn.gov.uk/meetings/sub_groups/maternal_child_nutrition/08092010.html (background paper link agenda item 5) http://www.sacn.gov.uk/meetings/sub_groups/maternal_child_nutrition/08092010.html Conclusions and decisions on response to CMACE/RCOG recommendation on high dose folic acid supplements for obese women. (See minutes page 15 point 37 onwards)

Centre for Maternal and Child Enquiries/Royal College of Obstetricians and Gynaecologists, Joint Guidelines for management of women with obesity in pregnancy, March 2010
http://www.rcog.org.uk/files/rcog-corp/CMACERCOGJointGuidelineManagementWomenObesityPregnancya.pdf

Detailed and practical advice about the five food groups and how to eat a healthy diet can be found in the Live Well section of the NHS Choices website:
www.nhs.uk/Livewell and
www.nhs.uk/Livewell/Goodfood/Pages/Healthyeating.aspx

Link to new NHS Choices pregnancy hub:
www.nhs.uk/Livewell/pregnancy/pages/pregnancyhub.aspx

Department of Health - The Pregnancy book (2009)
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107302

Healthy Start website (including sections and resources for parents and health workers) http://www.healthystart.nhs.uk/

Appendix 1 Weight Management before, during and after pregnancy – additional information

Author: Bradford Dietitians, Bradford Teaching Hospitals NHS Foundation Trust
Date: April 2011
Review due: December 2015