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**A HEALTHCARE  
PROFESSIONAL'S GUIDE  
TO *maternal nutrition***

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# PREGNANCY AND BREASTFEEDING: ESSENTIAL TOPICS TO COVER

Pregnancy often leads to many questions from mums and it can be difficult to remember all the areas to address during an appointment. The checklist below has been developed to help ensure you cover the essential topics of pregnancy and breastfeeding alongside the NHS Choices guidelines.<sup>1</sup>

- Mum's medical history
- The mental health risks and support options
- Antenatal screening
- The importance of exercise
- The benefits of a healthy diet:
  - Hydration and fluid intake
  - Fruits and vegetables
  - Saturated fats
  - Sugar intake
  - Vegetarian and vegan diets
  - Fortified foods
- Explain the specific vitamins and minerals that are important and why:
  - Iron
  - Folic acid
  - Calcium
  - Iodine
  - Omega-3
- Dietary sources that contain important minerals and vitamins needed for mum and the difficulties of sourcing them through diet alone:
  - Supplements
  - Risks associated with poor nutrition
- Information around energy requirements:
  - Recommended weight gain
  - Increased calorie intake
  - Risks of obesity and gestational diabetes
- Neural tube defects and the risks:
  - Spina bifida
  - Anencephaly
  - Medical history and prescription doses
  - Risk factors
- What mum can and cannot eat
- Pregnancy and alcohol
- Over-the-counter medicine during pregnancy

# WHAT SHOULD A HEALTHY DIET CONSIST OF DURING PREGNANCY?

Throughout pregnancy, good nutrition is key to ensuring a healthy mum and baby. A healthy, balanced diet should include a variety of fruit and vegetables, which provide vitamins, minerals and other key nutrients that a baby needs to develop. A balanced diet should also include dairy and non-dairy proteins, which promote foetal growth by providing the foetus with calcium and a range of amino acids.<sup>2,3</sup> Foods high in saturated fats such as cream, chocolate, crisps, pastries, cakes and fizzy drinks should be eaten in moderation in order to prevent excessive weight gain during pregnancy.<sup>3</sup>

Similarly, sugar should be consumed in moderation as this can also contribute to complications in pregnancy, such as gestational diabetes.<sup>4</sup> Therefore, to ensure mum is not “eating for two”, a common misconception, it is advised that mums opt for low-fat and low-sugar alternatives and increase their intake of foods with high levels of nutrients that are important during pregnancy.

Those who are vegetarian and vegan should alter their diet appropriately during pregnancy to ensure they are receiving enough protein and iron, which can be achieved through increasing their intake of nuts, pulses, beans and most dark leafy vegetables, such as watercress and kale.<sup>5,6</sup>

Fortified foods such as breakfast cereals can be a good source of nutrients during pregnancy, as long as they are nutritionally tailored to the needs of a pregnant mum.<sup>7</sup>

Pregnant mums can find it difficult to obtain their recommended daily intake of certain vitamins and minerals, therefore it is suggested that they take daily vitamin supplements or fortified snacks<sup>8</sup> such as a nutrimum bar to ensure these requirements are met.

## Why do breastfeeding women need a balanced diet?

If possible, exclusive breastfeeding is recommended for the first six months of an infant's life. Breastfeeding mothers require additional amounts of some nutrients, which is why it is important to ensure that they consume a balanced, varied diet.<sup>9</sup> The SACN (Scientific Advisory Committee on Nutrition) recommends that breastfeeding mums consume an extra 330 kcal per day for the first six months of lactation, to compensate for the increased energy demands of breastfeeding.<sup>9</sup> Nutrient intake among teenagers and younger women is poor compared with older women of childbearing age,<sup>10</sup> and supplements or fortified snacks<sup>9,10</sup> such as nutrimum may help mums meet the increased energy and nutrient requirements of breastfeeding.<sup>9</sup> Nutrimum provides breastfeeding women with a convenient source of nutrients and contributes to their increased daily energy demands.



## WHICH SPECIFIC NUTRIENTS ARE IMPORTANT DURING PREGNANCY AND BREASTFEEDING?

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During pregnancy and breastfeeding it is recommended that women meet the recommended intakes of iron, folic acid, calcium, iodine, vitamin D and omega-3.<sup>8</sup> Adequate nutrition may be attained through diet alone; however, it can be difficult to achieve on a daily basis.<sup>10</sup> Therefore, supplements taken in combination with a healthy diet can help mum achieve the necessary daily nutrient recommendations and keep baby healthy.<sup>8</sup>

**Iron** is an important component of haemoglobin in red blood cells, and is necessary for the transportation of oxygen around the body.<sup>11</sup> When pregnant, extra iron is needed to support additional red blood cells, the placenta and the growing baby.<sup>12</sup> Low levels of haemoglobin, referred to as anaemia, is fairly common in pregnant women.<sup>13</sup>

The main treatment options for iron-deficiency anaemia in pregnancy are oral supplements, or intravenous iron preparations. However, if the anaemia is severe and untreated during pregnancy there is an increased risk of foetal health complications such as, low birth weight and poor development.<sup>14</sup>

**Folic acid** is the synthetic form of folate, a water-soluble B vitamin which is found rarely in foods. It helps with the development of the nervous system throughout foetal growth. A deficiency in folate may contribute to the development of neural tube defects in the growing foetus, such as spina bifida or anencephaly.<sup>15</sup>

Folate deficiency in mum can produce similar symptoms to other nutrient deficiencies, such as vitamin B12. However, indicators of folate-specific deficiency include reduced sense of taste, muscle weakness and diarrhoea.<sup>16</sup>

Evidence suggests that folate levels in breast milk are maintained through maternal stores, therefore in order for baby to receive the optimum level of folate, mum should ensure she achieves the recommended daily requirements.<sup>17</sup>

**Calcium** is essential for the healthy development of foetal bones and teeth. Once baby has been born, calcium also has an important role in maintaining a normal heartbeat<sup>18</sup>, nerve transmission<sup>19</sup> and blood clotting.<sup>20</sup> Due to its role in supporting development and maintaining health, it is important that mum achieves the recommended daily levels whilst breastfeeding. Milk and dairy provide a great source of calcium.<sup>21</sup>

**Iodine** is an essential micronutrient for thyroid hormone synthesis, which is essential for baby's development, especially for the brain.<sup>22</sup>

It is important that whilst breastfeeding mum ensures she achieves her recommended daily requirement of iodine, as this impacts the levels found in breast milk and in turn how much baby receives.<sup>23</sup>

Vegetarians, vegans or anyone that avoids fish or dairy products may be less able to source iodine from food and may need to consume foods fortified with iodine or take iodine supplements.<sup>24</sup>

**Vitamin D** regulates the levels of calcium and phosphate in the body, which are necessary for keeping bones, teeth and muscles healthy. The vitamin is created in the skin in response to sunlight, therefore it can be difficult to get enough in the winter months. It is recommended that all individuals, including pregnant and breastfeeding women, take 10 micrograms of vitamin D a day.<sup>25</sup>

**Omega-3** fatty acids are a crucial element of human cell membranes and are important in the growth of foetal tissue.<sup>26</sup> They are involved in the development of the retina and brain, particularly in the last trimester of pregnancy.

Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are key omega-3 fatty acids. DHA represents about 97% of all omega-3 fats in the brain and 93% of all omega-3 fats in the retina. Developing babies cannot make their own DHA and therefore must obtain this from mum through the placenta.<sup>26</sup>

# WHY ARE SUPPLEMENTS TAILORED FOR PREGNANCY IMPORTANT?

Impaired antenatal nutrition can affect foetal development and growth in the short term, subsequent growth and cognitive development in the medium term, and risk of chronic disease in the longer term.<sup>27,28</sup>

Whilst a large number of nutrients can be absorbed through diet during pregnancy, due to increased metabolic demands for mum, supplements are recommended.<sup>29</sup> In order to meet the appropriate levels of each nutrient, supplements tailored specifically for pregnancy should be taken.

Supplementation can help to reduce the risk of low birthweight (LBW) infants, stillbirths and abnormal neurodevelopment.<sup>30</sup>

Nutrient	Why it is important	Recommended Daily Allowance during pregnancy	Dietary sources of nutrient
Folic Acid	Folic acid is the synthetic form of folate and folate deficiency can affect the body's ability to produce fully functioning red blood cells. <sup>16</sup> It can also result in foetal neural tube defects when present in pregnant women. <sup>15</sup>	The Department of Health recommend taking a supplement of 400 micrograms a day, before pregnancy and throughout the first 12 weeks, regardless of fortified food intake. However, those who have an increased risk of a pregnancy affected by a neural tube defect are advised to take a higher dose of 5 milligrams a day until they are 12 weeks pregnant. <sup>31</sup>	Food and drink rich in folic acid include green leafy vegetables and brown rice. <sup>8</sup>
Vitamin D	Vitamin D regulates the amount of calcium and phosphate in the body, which is needed to keep mum's bones, teeth and muscles healthy and to promote foetal growth. <sup>32</sup>	All adults, including mums, require 10 micrograms a day during winter months. <sup>33</sup> The Department of Health advises pregnant women to take a vitamin D supplement, <sup>8</sup> as it can be difficult to achieve the recommended daily requirements through diet alone, especially in the winter months.	Vitamin D is produced when our skin is exposed to UV light. Vitamin D can also be obtained from oily fish (such as salmon, mackerel, herring and sardines), eggs and red meat. <sup>8</sup>

Nutrient	Why it is important	Recommended Daily Allowance during pregnancy	Dietary sources of nutrient
Omega-3	DHA and EPA are omega-3 oils and are required for foetal development. They are essential for the healthy development of the eyes and brain. <sup>34</sup>	There are currently no government recommendations for pregnant women and omega-3, although intake has been linked to healthy foetal development. <sup>35</sup>	The main dietary source of omega-3 is oily fish, although some fortified foods do contain it, such as milk, orange juice and eggs. Supplements may also be considered, however cod liver oil should be avoided due to high levels of retinol, which evidence suggests can be harmful to the foetus. <sup>36</sup>
Iron	Current scientific evidence suggests that iron deficiency anaemia in pregnancy is a risk factor for preterm delivery, low birth weight, and possibly inferior neonatal health. <sup>14</sup>	The UK nutrient reference value for iron for women of child-bearing age is 14.8 mg per day. Whilst this recommendation does not increase specifically during pregnancy, it is important that pregnant women still meet these requirements. <sup>37</sup>	Iron can be sourced from lean meat, green leafy vegetables, dried fruit, and nuts. <sup>38</sup> Women who struggle to meet iron recommendations during pregnancy should consider supplements.
Calcium	Calcium is essential for the healthy development of foetal bones and teeth. Once baby has been born, calcium also has an important role in maintaining a normal heartbeat <sup>18</sup> , nerve transmission <sup>19</sup> and blood clotting. <sup>20</sup>	The recommended daily intake of calcium is 700 milligrams for women over 18 years of age. Whilst there is no additional increment for pregnancy, it is vital for baby's development. <sup>39,21</sup>	Sources include: green leafy vegetables – such as broccoli, cabbage and okra, soya beans, tofu, soya drinks with added calcium, nuts and bread. <sup>21</sup>
Iodine	The thyroid gland plays a vital role in the metabolism of iodine, <sup>40</sup> which is essential for baby's development, especially with respect to the brain. <sup>25</sup>	Although the UK dietary reference values indicate no additional increment during pregnancy, the recommended daily requirement provided by EFSA is 200 micrograms. <sup>23</sup>	Iodine is found in dairy products and seafood. <sup>23</sup>

# HOW MUCH WATER SHOULD PREGNANT WOMEN DRINK?

During pregnancy, hydration is especially important for mum and baby's health. The British Dietetic Association (BDA) recommends an increase of 300ml of water per day, compared to the normal intake for non-pregnant women, increasing the recommendation of total water intake to 1900 ml per day.

Hydration is especially important for mums who suffer from vomiting as a result of morning sickness. It is recommended that these mums drink in small amounts and often, rather than ingesting large volumes of water at once.<sup>42</sup>

## How much more food should mum be eating during pregnancy?

It is recommended that pregnant women increase their caloric intake in the third trimester by approximately 200 kcal a day.<sup>43</sup> It is important that mums understand the misconception of "eating for two" when pregnant, as overeating can have detrimental effects on the foetus including congenital abnormalities, still-birth and health problems for the baby later in life.<sup>44</sup>

## Recommended amount of weight that mums should gain:<sup>45</sup>

BMI	Weight gain
<18.5 (underweight)	13-18kg
18.5-24.9 (healthy)	11.5-16kg
25.0-29.9 (overweight)	7-11.5kg
>30.0 (medically obese)	5-9kg

During pregnancy, women who have a BMI of >30 have an increased risk of health complications<sup>46</sup>, which can have a detrimental effect on the baby. It is therefore key that mum recognises how much weight gain is healthy during pregnancy and that she still maintains a healthy diet. One of the most common health problems for pregnant women who are overeating is gestational diabetes, which is the result of high blood sugar from insufficient insulin release. Although gestational diabetes usually subsides after birth, the risk of long term implications for mum and baby can be reduced if detected and well managed.<sup>4</sup>

Obesity during pregnancy can also increase the risk of the baby having health complications later in life, such as type 2 diabetes, cardiovascular disease and obesity.<sup>47,48</sup>

## What are the risks associated with poor nutrition during pregnancy?

One of the major health concerns of poor nutrition during pregnancy, is the potential risk of neural tube defects in the developing foetus. These are birth defects of the brain, spine, or spinal cord that develop in the first month of pregnancy, often before a woman even knows that she is pregnant.<sup>15</sup> Two of the most common neural tube defects are spina bifida and anencephaly.

**Spina bifida** is a condition where the foetal spinal column does not close completely. There are several different types of spina bifida including neural tube defect, occulta, myelomeningocele and meningocele.<sup>49</sup>

Taking folic acid supplements before and during pregnancy has been shown to reduce the risk of spina bifida, therefore it is recommended by the Department of Health that women who are pregnant with no history of spina bifida take an over the counter (OTC) dose of 400 micrograms of folic acid daily.<sup>8</sup> However, for those with a history of neural tube defect, a prescription dose (5 milligrams) of folic acid is recommended daily.<sup>50</sup>

**Anencephaly** is a birth defect in which a baby is born without parts of the brain and skull, and occurs if the upper part of the neural tube does not fully close during foetal development. Risk factors include family history, maternal diabetes or low levels of folate during pregnancy.<sup>50,51</sup>

**Pregnant mums at risk of having a baby with neural tube defects should be prescribed 5 milligrams of folic acid a day.<sup>50</sup>**

### These risks include:

- Their partner having a neural tube defect
- Have a family history of neural tube defects
- Having diabetes<sup>50</sup>

# WHICH FOODS ARE CONSIDERED SAFE AND UNSAFE WHEN PREGNANT?

## Food that is safe:

**Shellfish** is safe, as long as it is heated thoroughly, as when raw it can contain harmful bacteria, viruses and toxins. These can lead to food poisoning, which in particular cases can affect both mum and baby.<sup>52</sup>

**Sushi** is safe, however, pregnant women should ensure that the fish has been frozen prior to serving, as this will kill any resident parasites within the raw fish.<sup>53,54</sup>

**Smoked fish** in the UK is safe to eat as the risk of infection is low. However, in some countries pregnant women are advised against smoked fish, as it may contain harmful bacteria such as listeria monocytogenes, which can harm both mum and baby.<sup>55</sup>

Mum's intake of tuna should be limited both during pregnancy and before conception, as it contains mercury, which is known to be detrimental to the development of a baby's nervous system. The NHS recommends that tuna intake should be limited to two steaks a week (170 grams each when raw) or four medium-sized cans of tuna a week (140 grams when drained).<sup>56</sup>

**Peanuts** are safe to eat when pregnant, as there is no clear evidence that suggests they can increase the risk of a baby developing an allergy in later life.<sup>56</sup>

**Milk and cream** should be either pasteurised or ultra-heat treated (UHT), as this removes harmful bacteria. This includes foods that contain milk or cream, such as ice cream, yoghurt and butter.<sup>56</sup>

## Food that should be avoided:

**Cold cured meats**, such as salami and chorizo, should be avoided when pregnant as these are not heat-treated. By not exposing these meats to high temperatures there is a risk that they still contain toxoplasmosis-causing parasites. Toxoplasmosis is a serious infection that can be passed to baby if mum becomes infected during pregnancy.<sup>56</sup>

**Pâté** is not safe to consume when pregnant, as it may contain listeria, a bacteria which can harm both mum and baby. The effects of this infection can be fatal to the foetus or can also lead to premature birth.<sup>56</sup>

**Fish oil supplements** that contain vitamin A (retinol) should be avoided during pregnancy, as excess intake has been linked to birth defects. Similarly, liver should be avoided due to its high retinol content.<sup>56</sup>

**Swordfish**, marlin and shark are all types of fish that should be avoided during pregnancy as they contain high levels of mercury, which is known to be detrimental to the development of a baby's nervous system.<sup>56</sup>

**Herbal teas** may contain a variety of unknown ingredients. As a result, it is recommended that herbal teas be avoided during pregnancy, as little research has examined the effects these teas can have on baby.<sup>56</sup>

**Game** is considered unsafe to eat when pregnant, as these types of meat are often killed using lead-based bullets.<sup>56</sup>

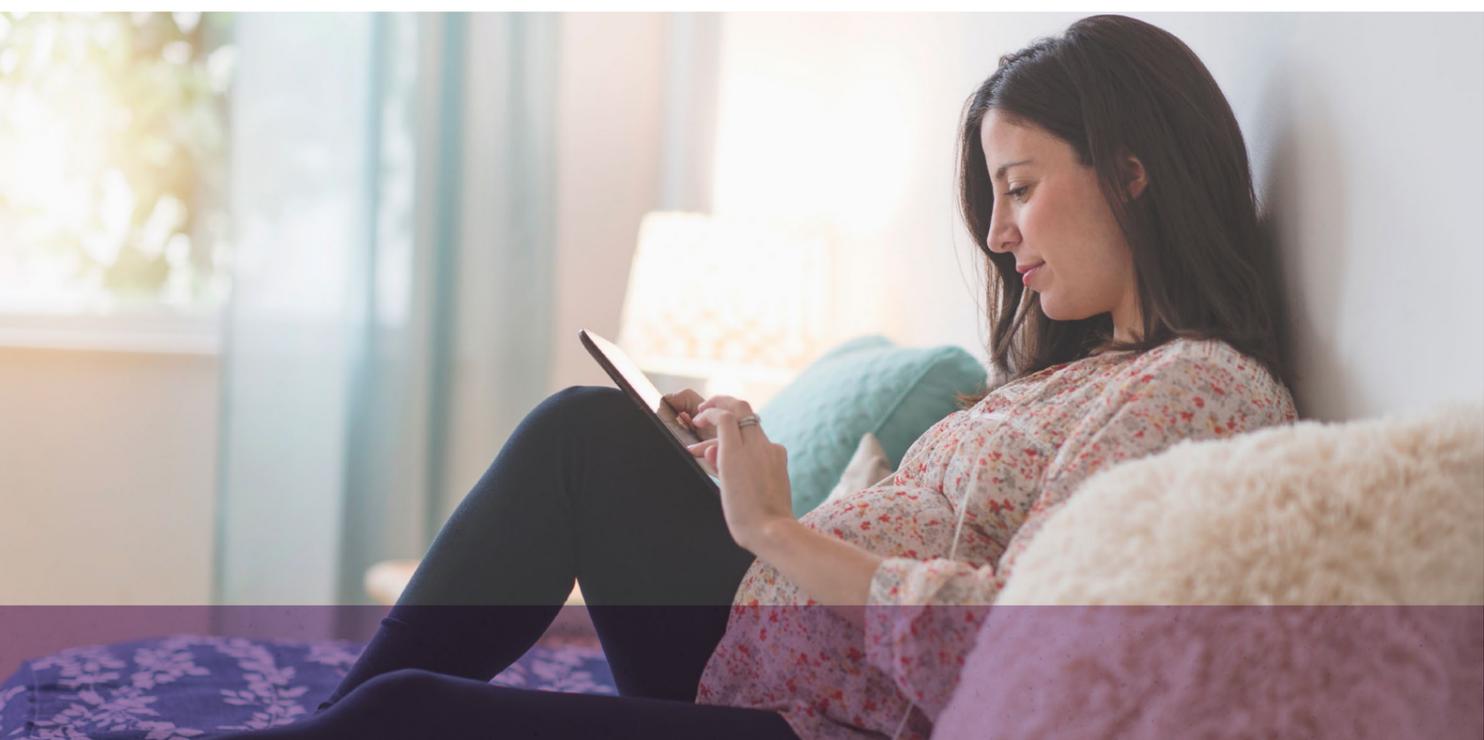
**Caffeinated drinks** such as tea, coffee and cola should be limited. Just 200 milligrams of caffeine is recommended a day, which is the equivalent of two mugs of instant coffee, one mug of filter coffee or two mugs of tea a day.<sup>56</sup>

**Uncooked eggs** should be avoided as they can carry salmonella, which can cause food poisoning. Whilst this is unlikely to harm the baby during pregnancy, it can make mum ill, inducing vomiting and diarrhoea.<sup>56</sup>

**Cheeses** that are considered soft and mould-ripened such as brie, camembert and goat's cheese (chevré) should be avoided when pregnant, as they carry the risk of a listeria infection. However, thorough cooking will kill any bacteria, making it safe to eat cooked soft cheeses or dishes that contain them.<sup>56</sup>

**Undercooked and raw meat** is unsafe to eat when pregnant, as it may carry the risk of salmonella and toxoplasmosis, which are known to be very harmful to baby.<sup>56</sup>

**Alcohol** should be avoided when pregnant, as the alcohol absorbed into mum's bloodstream passes to the baby. This can have serious consequences on the baby's development, and can lead to still-birth, miscarriage, low birth weight and Foetal Alcohol Syndrome Disorder (FASD).<sup>57</sup> This disorder can manifest in many ways and is linked to conditions such as learning disorders, cerebral palsy, epilepsy, problems with the liver, kidneys and heart. Foetal Alcohol Syndrome (FAS) lies at the most severely affected end of the FASD spectrum, and is usually identified by distinct facial features.<sup>58</sup>



# WHAT INFORMATION CAN I PROVIDE TO PREGNANT MUMS AROUND COMMON OTC MEDICATIONS?

Paracetamol is often the favoured painkiller for pregnant women to take. However, recent research has suggested that taking this medication during pregnancy could be linked to the child developing neurological disorders in later life.<sup>59</sup> Whilst this topic remains poorly understood, it should be highlighted that this research was based on cohort studies and as a result has limitations, and therefore further scientific research is required. It is recommended that mum seeks advice from her GP on painkillers during pregnancy.

Ibuprofen should be avoided when pregnant. In the first 30 weeks of pregnancy this medication is linked to complications such as miscarriage, and after 30 weeks it is linked to decreased amniotic fluid and increased cardiac problems in the baby.<sup>60</sup>

One of the common side effects of pregnancy is acid reflux. To treat this, alginates and antacids are often prescribed. These are effective in reducing the symptoms of reflux, however antacids should be taken in moderation as they are known to exacerbate constipation and diarrhoea.<sup>61</sup>

Constipation is common during pregnancy and can be treated with laxatives, however pregnant women should avoid using stimulant-based laxatives, as these can cause the uterine muscle to contract. Alternative laxative options for pregnancy include bulk-forming laxatives, which make stools softer. Osmotic-based laxatives can also be taken, which increase the amount of fluid in the bowel.<sup>62</sup>

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