



# Pacific Guidelines for Healthy Eating During Pregnancy

**A Handbook for Health Professionals and Educators**

by

The Public Health Division of the Pacific Community

Noumea, New Caledonia, 2019



Pacific  
Community  
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# Introduction

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Traditional diets of the Pacific Island countries and territories (PICTs) are unique, thanks to the region's tropical agriculture and rich fisheries and to the importance of local foods to Pacific cultures. Although, historically, diets across the islands were rich in root crops, fish, coconut products and local green vegetables and fruits, since the 1950s, economic development, modernisation and globalisation have altered Pacific Island diets and nutrition. Increasingly, Pacific diets have come to rely on commercially processed foods, including refined carbohydrates, energy dense and nutrient poor sugar sweetened beverages, and high fat products, such as tinned beef and mutton flaps.<sup>1</sup> Nutritionally, these dietary changes have translated into reduced intake of vitamins, minerals and fibre alongside an increase in calories, added sugar and unhealthy fats.<sup>2,3</sup> States of under-nutrition, which have historically affected the region, also prevail with protein energy malnutrition, iron and vitamin A deficiency causing high rates of anaemia and stunting.<sup>4</sup> These nutritional changes have contributed to the triple burden of malnutrition in PICTs<sup>5</sup> where under-nutrition, micronutrient deficiencies and obesity co-exist.<sup>6-9</sup> As a consequence, the Pacific Islands now show some of the world's highest levels of obesity and non-communicable diseases (NCDs), such as Type 2 Diabetes (T2DM).<sup>10</sup> Women are disproportionately impacted by the triple burden of malnutrition and show high rates of food insecurity, micronutrient deficiencies and obesity.

## The Importance of Dietary Guidelines for Pregnant Women in the Pacific

The first 1000 days of life, from conception to a child's second birthday, are critical to long-term health<sup>11</sup> and require proper nutrition to ensure healthy mental and physical development of the child. Maternal nutrition during pregnancy is recognised as a key determinant and, thus, key point of intervention to ensure healthy pregnancy outcomes and improve the long-term health of the mother and her child.<sup>12</sup> During pregnancy, the growing child is entirely dependent on the mother's nutrition. Poor nutrition poses risks to the health of both the expectant mother and her growing child, and deficiencies are likely to hinder the child's growth and development. It is important for the expectant mother to build up essential nutrients, such as calcium and iron, needed for breastfeeding.

Recent findings show that the impact of maternal under-and-over-nutrition extends far beyond the first 1000 days, influencing the child's risk of obesity and NCDs later in life. While this research is still evolving, the association between maternal nutrition and a child's long-term health is believed to be due to epigenetic changes that the foetus undergoes in response to its environment, which is influenced by diet and lifestyle. This process then impacts the child's life-long metabolism leading to an inter-generational propensity for NCD risk factors.<sup>12</sup> The impact is not limited to a mother's nutrition during pregnancy but also her pre-pregnancy nutrition and body weight. In light of the Pacific's current obesity epidemic,<sup>3</sup> the long reaching consequences of poor maternal nutrition paint a worrying picture for the Pacific's future health. Of particular concern in the Pacific is the high rate of adolescent pregnancies. As adolescent mothers are still growing and prone to macronutrient deficiencies themselves, their nutritional needs are even greater.<sup>12</sup> Unplanned pregnancies are also common in the region, which contributes to the need to target all women of reproductive age.

While data is scarce on the impact that maternal nutrition has on children, it is believed to be correlated with pre-term births and, according to Global Burden of Disease (GBD), pre-term births account for 3.2 per cent.<sup>13</sup> While the Pacific tends to show lower prevalence of childhood allergies and wheeze, significant regional variations are evident.<sup>14</sup>

Improving maternal health is a key priority of health ministries and international development agencies in the region. While notable reductions were achieved in pursuit of the Millennium Development Goals (MDG), by 2015, the region had achieved only a 64 per cent reduction in maternal mortality ratio compared to the 75 per cent target. Targeting adolescent girls and women of reproductive age with nutritional interventions both prior to and during pregnancy can help improve these health statistics and foster progress toward achievement of the Sustainable Development Goals by 2030.<sup>8</sup>

Pregnancy presents a critical opportunity to encourage positive behavioural changes in mothers who are motivated to ensure their children's health and well-being. Mothers are in frequent contact with health professionals through antenatal clinics, which are well attended throughout the Pacific.<sup>15</sup> Further, the availability of nutritional guidelines for pregnant women has the potential to improve maternal and child health while interrupting the inter-generational NCD cycle and helping offset the tendency toward poor health in the Pacific.

To inform these guidelines, a literature review was conducted of both Pacific and international sources. The recommendations provided in Part 2 of this booklet are based on research conducted in the Pacific, research conducted internationally, and existing dietary guidelines for pregnant women.

## Setting Nutritional Guidelines

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*Facts for Life*, a joint publication by UNICEF, WHO, UNESCO, UNFPA, UNDP, WFP, UNAIDS and the World Bank, outlines key recommendations to ensure the health of children.<sup>16</sup> It also stresses that women should consume more nutritious meals and increase their energy intake during pregnancy to reduce health risks to both themselves and their children.<sup>16</sup> By consuming nutritious meals in healthy quantities, pregnant women tend to feel stronger, have more energy and experience healthier pregnancies.<sup>16</sup> Nutritious foods that are rich in necessary nutrients, such as iron, vitamin A, calcium, iodine and folic acid, include meat, dairy products, fish, eggs, green leafy vegetables, and orange or yellow fruits and vegetables.<sup>17</sup> To meet nutritional requirements and achieve positive antenatal outcomes, including reduced risk of anaemia, low birth weight and pre-term birth, WHO recommends that expectant mothers take iron and folic acid supplements during pregnancy<sup>18</sup> and, to reduce the risk of neural tube defects, WHO also recommends that women take folic acid supplements prior to conception.<sup>18</sup> In countries with low calcium intake supplementation is also recommended during pregnancy due to its role in protecting mothers from pre-eclampsia.<sup>18</sup>

The *Pacific Guidelines for a Healthy Diet and Lifestyle* focus on the three food groups, which include protective/health, energy, and body-building foods.<sup>19</sup> Because the Pacific region does not have specific nutrient reference values (NRVs), these guidelines use the NRVs of Australia and New Zealand, given the proximity of these countries to the PICTs and their substantial Pacific populations.<sup>20</sup>

### Goals and Objectives

The primary objective of these guidelines is to offer evidence-based dietary recommendations to health professionals in the Pacific who provide advice related to family planning or pregnancies as well as recommendations to support development of health resources and interventions that promote healthy maternal nutrition.

Drawing on estimated NRVs for pregnancy,<sup>20</sup> evidence of the impact of maternal nutrition on child health, and existing dietary guidelines, five priority areas related to pregnancy nutrition emerge: maternal obesity and gestational weight gain; healthy dietary patterns; foods to avoid in pregnancy; nutritional supplements; and food safety. These guidelines focus on these nutritional health concerns with respect to Pacific women and provide evidence-based recommendations for health professionals to follow in order to encourage pregnant women to:

- eat a variety of protective/health, energy and body-building foods, prioritising those that are locally produced;
- ensure the right quantities are consumed to meet the daily nutritional needs of both the expectant mother and her growing child;

- achieve/maintain a healthy weight and level of weight gain during pregnancy;
- consume supplements, as needed and in appropriate quantities;
- adhere to food safety guidance;
- manage typical side effects of pregnancy (e.g. nausea, vomiting, morning sickness); and
- ensure proper and timely diagnosis and management of medical conditions (e.g. gestational diabetes, hypertension).

## Healthy Eating for Healthy Pregnancies

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A healthy diet is critical to the healthy development of a growing baby. Pregnancy presents an opportunity to promote good health and break the cycle of NCDs. These guidelines are designed to maximise health outcomes for both the expectant mother and her child and can be used to guide mothers toward choices that will help ensure healthy pregnancies and futures.

Consuming healthy foods and nutritional supplements, being active, and accessing medical care while pregnant can protect mothers from conditions like gestational diabetes and hypertension, promote safe births, ensure the healthy growth of the child, and foster the long-term health of both the mother and her child.

These guidelines provide the information needed to assist you in supporting expectant mothers to make nutritional choices that meet their needs throughout pregnancy.

1. **Pregnant women should eat a variety of foods from the three food groups in appropriate amounts each day, and should choose fresh, local products.** (Note: These are the same foods as those promoted in the *Pacific Guidelines for Healthy Living*.)

- **Protective foods provide healthy vitamins and nutrients to build and strengthen the immune systems of expectant mothers and their babies.**

Pregnant women should aim for at least 6 servings of fresh, locally grown vegetables and fruits each day. Women should aim to eat a variety of types and colours of these foods, prioritising leafy green vegetables and orange coloured fruits and vegetables (pawpaw, pumpkin, carrots) as these are rich in vitamins, calcium, iron and folate, which are essential to expectant mothers and their babies. Expectant mothers and women planning their pregnancies should aim to eat more fruits and vegetables than other adults to meet their need for additional nutrients.

- **Energy foods provide pregnant women with the strength and energy needed to remain active.**

Pregnant women should aim for 4-6 servings of energy foods each day. Energy foods contain carbohydrates, fats and proteins and include root crops, breadfruit, rice, breads and cereals. Colourful root crops (orange sweet potato, purple taro) eaten alongside a whole grain (including fortified, unprocessed grains such as brown bread or brown rice) provide additional nutrients. For healthy weight gain, women who are overweight or obese should limit their consumption of energy foods to four servings.

- **Body-Building foods support the growth of babies while also providing mothers with important nutrients.**

Pregnant women should aim for three servings of body-building foods each day. Rich in protein, these foods are essential for healthy growth and include fish, chicken, meat, eggs, tofu, nuts, seeds, legumes and beans. Fish is an excellent source of protein, iodine and healthy fats but needs to be well cooked. Fish containing a lower quantity of mercury (e.g. small reef fish, wahoo, mahimahi, skipjack tuna, shellfish) should be prioritised. Milk provides protein and calcium; if possible, at least one glass of milk (in either liquid or powdered form) should be consumed every day.

- **Pregnant women should stay hydrated by drinking plenty of healthy fluids throughout the day.**

During pregnancy, women often feel hot and may perspire more frequently. As a consequence, they may become dehydrated. It is important for pregnant women to stay hydrated by drinking regularly. Water is the healthiest choice. Milk and fresh coconut water can also be healthy choices. Sugary drinks (juice, soft drinks) should be avoided. As it can interfere with nutrient absorption, tea should only be drunk between meals and should be served with milk. Added sugar should be avoided. Lemon or lemon leaf tea can be substituted in place of black tea, as they do not interfere with nutrient absorption.

Note: Drinking too much caffeine can harm the growing baby. Drinks that contain caffeine include coffee, tea, energy drinks and cola soft drinks.

- **Women should cut back or avoid eating foods and drinks that are high in sugar, unhealthy fats and salt during pregnancy.** It is important to advise women **only to use iodised salt** at home, if needed, and to use it sparingly.



2. **Pregnant women should aim for healthy weight gain during pregnancy to ensure the healthy development and future of their babies.**

- A woman's pre-pregnancy weight is an important predictor of health outcomes for both the expectant mother and her child. Women who are planning pregnancies should follow the Pacific Guidelines for A Healthy Diet and Lifestyle to achieve a healthy body weight.
- Most women require around 2000 calories per day and slightly more during the second and third trimesters.
- Weight gain should start in the second trimester. The amount gained depends on pre-pregnancy weight (or weight at the first antenatal visit). Pregnant women should be advised to follow the weight gain guidelines provided below:<sup>20</sup>

Pre-pregnancy BMI	Total weight gain recommended during pregnancy (kg)
Underweight (<18.5 kg/m <sup>2</sup> )	13–18
Normal Weight (18.5–24.9 kg/m <sup>2</sup> )	11–16
Overweight (25–29.9 kg/m <sup>2</sup> )	7–11
Obese (>30 kg/m <sup>2</sup> )	5–9



3. Because it can be difficult to consume a sufficient quantity of certain nutrients required during pregnancy, it is essential to **prescribe the right supplements for a healthy pregnancy**. These include an iron and folic acid supplement and, in some cases, a calcium supplement. Expectant mothers should not take any supplements that have not been prescribed for them and should always follow the dosage recommended. It can be harmful to exceed recommended amounts.



4. **Some foods are dangerous to eat while pregnant and should be avoided.** Some foods can carry harmful bacteria or viruses and, if uncooked or not heated properly before eating, can harm the baby. Foods to avoid include raw fish and seafood (including fish salad where fish is cooked in lemon/lime), undercooked meat (where some of the meat is still pink), undercooked eggs (including soft yolks, homemade mayonnaise and mousse), unwashed fruits and vegetables, fresh juice (as the fruit may not have been washed), fresh/unpasteurised milk, soft serve ice cream, cream and custard products (including those in cakes and slices), homemade and soft cheeses (e.g. brie and camembert), pre-prepared salads (including pasta/rice salad and coleslaw), reused dips and salad dressings, and cold meats (e.g. ham, luncheon meats and cold chicken). It is also important to **avoid alcohol, kava and betel nuts** as they can harm the growing baby.



5. **While pregnant, a woman's immune system is weaker than normal. Illnesses can quickly pass from the mother to the growing child.** To protect both the expectant mother and her child, it is important to be especially cautious and to follow food safety guidance provided in the *Pacific Guidelines for A Healthy Diet and Lifestyle*. Food safety includes: washing hands with soap before and after handling food; thoroughly washing all vegetables, fruits and root crops; carefully following 'best before' and 'use by' dates on food labels; only eating leftovers that have been kept in a refrigerator set below 4°C and reheated until they are steaming hot, and ensuring that leftover food that has not been kept in a refrigerator is strictly avoided; using only clean water; cooking food thoroughly and keeping raw and cooked food separate during storage and preparation.



6. Healthy eating during pregnancy can help **prevent and manage typical side effects experienced during pregnancy** (including nausea, constipation and food cravings) and **reduce the risk of complications associated with pregnancy** (including gestational diabetes, maternal hypertension and traumatic births).



To ensure optimal health and comfort during pregnancy, healthy eating should encompass each of the recommendations outlined above.

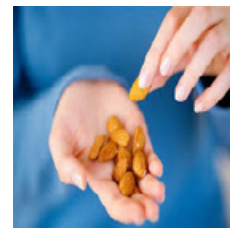
## A Sample Day of Healthy Eating

What does a day of healthy eating look like? Most adult women require between 1800 and 2000 calories each day (with women who are not physically active consuming closer to 1800 calories). While pregnant, it is especially important that these calories come from nutrient rich food choices. A sample day of healthy eating is provided below:



### Second Trimester

Expectant mothers should consume an additional 300 calories per day for a total of 2300 calories per day.



### Third Trimester

Expectant mothers should consume an additional 450 calories per day for a total of 2450 calories per day.



## Should expectant mothers eat for two?

**No.** It is a myth that pregnant women should consume enough food for two people during pregnancy. In fact, pregnant women actually only need around 450 additional calories per day (above their usual 2000 calories per day) in the third trimester when their babies are experiencing the most rapid growth. Following the 'eating for two' myth can put the baby at risk as it leads to excessive weight gain, which is associated with gestational diabetes, maternal hypertension and high birth weight.

Milk (including milk powder) is rich in calcium, which is an essential nutrient for healthy pregnancies. Other dairy products (including yoghurt and cheese) are also excellent sources of calcium. Vegetables (including bok choy, broccoli, watercress, okra, dark green leafy vegetables), tofu, fish and shellfish (especially those with edible bones and shells such as sardines, tinned salmon, prawns, clams and crab), legumes (including soybeans and chickpeas), tofu and nuts also contain calcium, although it is difficult to eat enough of these foods to meet daily calcium needs.

## Are there alternatives to milk?

## Optimal Servings for A Healthy Pregnancy

To consume the nutrients needed and achieve healthy weight gain, expectant mothers should aim to meet the recommended servings from healthy food choices within each food group outlined in the table below.

	Servings Per Day	Foods to Choose
<b>Protective Foods</b>	<p><b>At least 6</b></p> <p>1 serving of vegetables contains approximately 30 calories</p> <p>1 serving of fruits contains approximately 50 calories</p> <ul style="list-style-type: none"> <li>• 1 cup green leafy vegetables</li> <li>• ½ cup cooked leafy vegetables</li> <li>• ½ cup mixed frozen vegetables</li> <li>• 2 tomatoes (if small)</li> <li>• ½ cup of diced pumpkin</li> <li>• ½ cup chopped fruit</li> <li>• 1 banana</li> <li>• 1 pineapple stick</li> <li>• ¼ pawpaw</li> </ul>	<p>All fruits and vegetables. At least 1 serving of green leafy vegetables and 1 serving of orange fruit or vegetable each day. 1 serving of vegetables is 1 cup of salad veggies, ½ cup of cooked veggies or 1 whole carrot/tomato. 1 serving of fruit is ½ cup of diced fruit or 1 banana.</p>
<b>Body-Building Foods</b>	<p><b>At least 3</b></p> <p>1 serving of body-building foods contains approximately 130 to 150 calories</p> <ul style="list-style-type: none"> <li>• Meat/chicken 70g</li> <li>• 1 cup of mixed dishes (e.g. stir-fry)</li> <li>• 100g fish</li> <li>• 2 eggs</li> <li>• 30g nuts</li> <li>• 250ml milk</li> <li>• 150g tofu</li> <li>• 1 cup legumes (e.g. dhal, beans, lentils, chickpeas)</li> </ul>	<p>70g of local, lean cuts of well cooked meat and chicken, 100g of fish at least 2 times per week, 2 well cooked eggs, 1 cup beans and legumes, 30g nuts (unsalted), 1 glass of reduced fat milk, ¾ cup yoghurt or 40g cheese</p>

	Servings per day	Foods to Choose
<b>Energy Foods</b>	<p><b>4-6 servings</b></p> <p>1 serving of energy foods contains approximately 130 to 150 calories</p> <ul style="list-style-type: none"> <li>• 120g cassava/taro</li> <li>• 120g cooked brown rice</li> <li>• 1 slice brown bread</li> </ul>	1 fist of locally grown root crops, breadfruit, cooked green bananas, 1 slice of whole grain bread, ½ cup of brown rice, or ½ cup of porridge
<b>Drinks</b>	<p><b>At least 8 glasses per day</b></p> <p>Possible tips: water is calorie free; a cup of tea with milk and no sugar is around 30 calories; 1 baby coconut has around 80 calories</p>	Water, milk, coconut water, lemon leaf/grass tea, or black tea (only between meals and without added sugar)

Tip: 1 cup is equivalent to approximately 2 cupped handfuls; ½ cup is equivalent to approximately 1 cupped handful, 1 serving of body-building and energy foods is roughly the same size as a fist.

## Quick Guide on Foods to Eat, Reduce and Avoid During Pregnancy



**Foods to eat:** Prioritise vegetables (especially leafy green vegetables), fruits, colourful root crops (orange sweet potato, purple taro), beans and legumes (dhal, lentils, chickpeas), cooked eggs, wholegrain cereals (brown bread, brown rice), nuts, seeds, well-cooked lean meats, chicken, and fish alongside healthy drinks (water, lemon leaf tea, coconut water), as well as at least one glass of milk per day. These foods and drinks should comprise the majority of what pregnant women consume each day.



**Foods to avoid/reduce:** Cut back on foods that are high in sugar (juice, soft drinks, sweets, chocolate, biscuits, cakes), salt (chips, soy sauce, salted nuts, noodles) and unhealthy fats (fried foods, sausage, corned beef). These unhealthy foods can increase the risk of excessive weight gain during pregnancy, high blood pressure or blood sugar issues and may also foster unhealthy food cravings for the developing child. Because tea can block the absorption of needed vitamins, it is important to drink tea between meals and avoid adding sugar to it. Large fish (shark, walu, swordfish and albacore tuna) should be avoided or reduced to a small serving once per week.



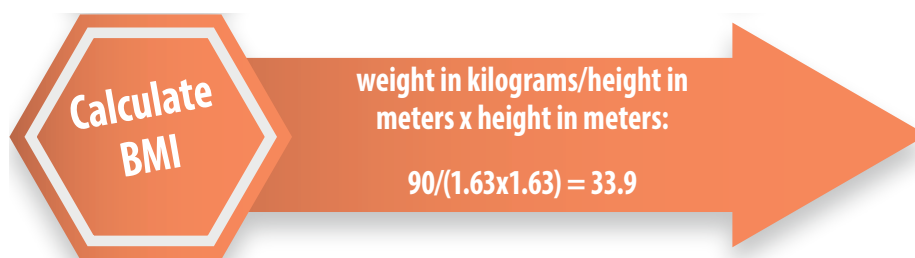
**Foods to avoid:** Avoid alcohol, kava and betel nut due to the harm they can cause the baby. Avoid high-risk foods that may carry harmful bacteria and viruses: undercooked meat and chicken; undercooked eggs; raw fish, including fish salad (kokoda, ota ika); soft and homemade cheeses; cold meats (ham, cold chicken, luncheon, smoked fish); pre-prepared salads and dips; soft serve ice creams; cream/custard cakes; unwashed fruits, vegetables and root crops.

Note: The *Pacific Guidelines for A Healthy Diet and Lifestyle* provide additional information on healthy eating for the general public.

## Healthy Weight Gain in Pregnancy

Achieving a healthy body weight before pregnancy is one of the most important measures women can take to ensure a healthy pregnancy. Once pregnant, weight gain, as indicated in the table below, is important for the health of the expectant mother and her child. Gaining a healthy amount of weight also helps reduce the long-term risk of NCDs faced by both the mother and her child.

**How much weight should pregnant women gain?** The weight that a pregnant woman should gain depends on her pre-pregnancy BMI. Weight gain should not commence prior to the second trimester (after week 12). In order to determine how much weight gain to recommend, it is important to record the mother's weight at each health check.



	Pre-pregnancy BMI			
	<18.5	18.5–24.9	25–29.9	>30
Weight 1 <sup>st</sup> Trimester (weeks 0–12)	1–3 kg	1–3kg	1–3kg	0.2–2kg
Rate of weight gain in 2 <sup>nd</sup> and 3 <sup>rd</sup> Trimester (weeks 13– birth)	0.45–0.6kg per week	0.4–0.5kg per week	0.2–0.3kg per week	0.2– 0.3kg per week
Total weight gain during pregnancy	12.5–18kg	11.5–16kg	7–11.5kg	5–9kg

### Move for health

Pregnant women should aim for at least 30 minutes of physical activity five days per week. While pregnancy is not the time to start an intense workout regime, ensuring 30 minutes of activity per day is critical to a healthy pregnancy. Lighter activities (walking, swimming, dancing, gardening) are recommended. A walk outside is an excellent way to meet exercise goals while also getting vitamin D through sunshine.

## Food Safety

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Food safety should be a priority. Women's immunity is weakened during pregnancy and foodborne illnesses can be especially harmful to the growing baby, resulting in birth defects, complications and even miscarriage. The food safety guidance, provided below, should be followed and promoted.

**Wash:** Wash and dry hands thoroughly before and after handling food, after using the toilet, and after coming into contact with animals, soil or faeces. Wash all vegetables, fruits and root crops well to avoid contamination with soil or bacteria.

**Clean:** Clean cooking utensils and kitchen areas well. Use a different cloth to wash dishes and to clean the kitchen than is used to clean other areas of the house. To avoid contamination, wash chopping boards well in between preparing raw and cooked foods. (Tip: Dry chopping boards in the sun to help sanitise them through heat, and use a separate chopping board for raw meat.)

**Cook:** Cook meats, poultry and fish until they are well done. Only eat leftovers that have been stored in the refrigerator and reheated until they are steaming hot, and do not reheat them more than once. Use clean water during cooking and, if clean water is not accessible, boil, filter or sterilise the water.

**Check:** Check 'use by' and 'best before' dates and avoid eating leftover foods that are older than two days.

**Chill:** Ensure refrigerators are set at a temperature between 2°C and 4°C. If leftovers cannot be refrigerated, avoid eating them.

**Avoid:** Avoid high-risk foods that may carry harmful bacteria or viruses. (Refer to the list of these foods provided on page 10.)

Keep food safety rules in mind while eating outside the home (at restaurants, fast food shops and even the homes of friends and family). Avoid high-risk foods, such as pre-prepared salads, cream cakes, undercooked meat and buffets (buffets pose a significant risk!) where food has been left sitting for extended times. Pregnant women should request that their food be served  **piping hot** .

### Restaurants, cafes and takeaways

# Promoting Nine Months of Nourishment

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The key priorities for providing nutrition advice are outlined below, according to the different stages of pregnancy. (See page 19 for a summary of these priorities.)

**Planning a pregnancy:** The most important measures expectant mothers can take to improve their nutrition before becoming pregnant are outlined below.

- Aim for a healthy body weight by following the *Pacific Guidelines for A Healthy Diet and Lifestyle*. Eat a healthy balance of the three food groups (including at least six servings of veggies and fruits per day) and ensure 30 minutes of physical activity at least five days per week.
- Start taking iron and folic acid supplements at least three months before becoming pregnant to help lay the foundation for healthy development from conception. This form of supplementation can also reverse and prevent maternal anaemia and reduce the risk of low birth weight and pre-term infants.

## Essential Supplements

All women who are planning a pregnancy should take 400 milligrams of folic acid supplements for at least three months prior to conception. In countries where iron deficiency is common, it is important to check for anaemia and to take iron supplements, if needed.

During pregnancy, all women should take **30-60 milligrams of iron and 400 milligrams of folic acid supplementation every day**. If diagnosed with anaemia (under 110 grams/litre blood haemoglobin), these supplements should be increased to 120 milligrams of iron along with 400 milligrams of folic acid per day.<sup>18</sup> Taking iron and folic acid supplements helps prevent anaemia in expectant mothers. If left untreated, anaemia can cause mothers to be lethargic and can weaken their immune systems. Supplementation can help ensure the baby maintains a healthy birth weight and it can also help prevent birth defects.

For mothers with **low calcium intake** (which is very common in the Pacific), supplementation between **1.5 and 2 grams of calcium per day** is recommended during pregnancy to prevent maternal hypertension and encourage healthy bone growth in the child.<sup>18</sup>

## First Trimester (Weeks 0–12)

It is time to prioritise a healthy diet. During the first 12 weeks of pregnancy, it is essential for women to eat ample nutritious foods while still avoiding excess calories. Staying active is critical for the health of the child, as well as for the mother's physical and mental health. Topics to cover in discussions with mothers are outlined below.

### Healthy Eating:

Counsel expectant mothers on the importance of healthy eating, foods to prioritise, and foods to reduce/eliminate. Encourage mothers to track their own eating habits to help them identify where they are achieving their goals (e.g. at least one glass of milk per day, six servings of vegetables and fruit – including one serving of leafy green vegetables and one serving of orange vegetables or fruit – and three servings of body-building foods) as well as areas where they may be falling short of reaching them.

### **Foods to Avoid:**

Emphasise the need to avoid certain foods that may harm the baby and to be vigilant with food safety. (See the section entitled 'Food Safety' for further information.)

### **Supplements:**

Talk through the importance of taking iron and folic acid supplements daily (and calcium, where needed).

### **Weight Gain:**

Calculate the recommended weight gain for each mother. Ensure all expectant mothers understand that there are no additional calorie needs during the first trimester, there is no need to 'eat for two', and weight gain should not occur until the second trimester.

### **Health Check:**

Check blood pressure, blood glucose levels (referring to the section on 'Gestational Diabetes (GDM)' for cut-off levels related to gestational diabetes) and haemoglobin levels.

### **Managing Common Side Effects:**

Provide advice to help expectant mothers manage common side effects (morning sickness). (See the section entitled 'Managing Common Side Effects' for further information.)

## **Baby growth update**

The baby is growing quickly during these initial 12 weeks. The baby's bones, muscles and organs are all forming and, by 12 weeks, the baby will be the size of a lime and will have a heartbeat!

## Second Trimester (Weeks 13–26)

The second trimester is when pregnancy really starts to feel 'real' and a baby bump starts to show. It is important for mothers to maintain the healthy eating and regular physical activity they started in the first trimester. Mothers need just 300 more calories each day during this trimester, the equivalent to roughly a glass of milk and a banana or a small handful of nuts and a cup of chopped fruit.

### Healthy Eating:

- Emphasise the need to continue with healthy eating and food safety guidelines.
- Check that the expectant mother is drinking milk and eating body-building and protective foods on a daily basis.

### Supplements:

Ensure compliance with nutritional supplements and emphasise their continual need.

### Weight Gain:

Monitor weight gain, and guide the expectant mother through the recommended amount of weight gain during the second trimester. Ensure she understands that the weight gain needed can be achieved with just 300 additional calories per day, and remind her to avoid the foods listed under the section entitled 'Foods to Avoid'.

### Managing Common Side Effects:

Provide advice for managing common side effects. (See the section entitled 'Managing Common Side Effects' for further information.)

### Health Check:

Ensure high-risk mothers are screened for gestational diabetes, maternal hypertension (outlined further under the section entitled 'Hypertension'), and anaemia.

## Baby growth update

By 20 weeks, mothers may start to feel the baby kicking. The baby will quickly grow from the size of a banana at 19 weeks, to a mango at 22 weeks and a coconut at 27 weeks. By 27 weeks, the baby will have started to grow hair and may respond to loud noises with a jump or kick.

## Third Trimester (Week 27-Birth)

The end is in sight! During the third trimester, calorie requirements are only slightly higher than during the second trimester.

### Healthy Eating:

- Emphasise the need to continue with healthy eating and adhere to the food safety guidance, avoiding the foods listed under the section entitled 'Foods to Avoid'.
- Verify that the expectant mother is eating body-building and protective foods on a daily basis.
- Advise the expectant mother to aim for two glasses of milk per day.
- Ensure the expectant mother is physically active. Walking is an excellent choice; some women may find that walking in water is most comfortable.

### Nutritional Supplements:

- Ensure compliance with nutritional supplements and emphasise their continual need.

### Weight Gain:

- Monitor weight gain, and guide the expectant mother through the recommended amount of weight gain during the final trimester. Ensure she understands that the weight gain needed can be achieved with just 400 additional calories per day.

### Managing Common Side Effects:

- Provide advice to help expectant mothers manage side effects, such as constipation and acid reflux. (Refer to the section entitled 'Managing Common Side Effects' for further information.)
- Remind expectant mothers that it is important to sleep on their sides (especially the left side) during this trimester, as this increases the amount of nutrients reaching the baby.
- Emphasise the need to drink plenty of water (over 8 glasses) throughout the day, as expectant mothers may find themselves feeling hotter and perspiring more.
- Assure expectant mothers that it is normal to have yellow discharge from their breasts as their bodies prepare for breastfeeding.

### After Pregnancy:

- Discuss the importance of breastfeeding and healthy eating after pregnancy. (Refer to the section entitled 'Healthy Eating After Pregnancy and During Breastfeeding' for further information.)

## Baby growth update

They're growing so quickly! During this time, the baby's brain and body is rapidly growing. They are learning to hear, blink, grasp and breathe. They're also growing – from a coconut at 27 weeks, to a pineapple at 33 weeks and a watermelon at 40 weeks!

## Managing Common Side Effects

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Many women experience uncomfortable symptoms during pregnancy. Symptom busters are provided below to help reduce these side effects.

### Nausea?

Many women experience hyperemesis (nausea and morning sickness) during their first trimester. To help reduce this side effect:

- eat small meals throughout the day, rather than three large meals;
- eat breakfast daily and avoid long gaps between meals; and
- consider trying ginger (as tea or by adding it to meals for extra flavour).

### Constipation?

Hormonal changes and iron supplements make this symptom common during pregnancy, especially the third trimester. For regular bowel movements:

- eat plenty of fibre from protective foods, wholegrain energy foods, legumes and beans; plus
- drink plenty of water (at least 8 glasses per day); and
- maintain an active lifestyle (at least 30 minutes per day), and avoid sitting still for long periods of time.

### Heartburn, Gastritis or Reflux?

This can cause stomach or chest pain, a burning feeling in the stomach or throat and indigestion. To help manage it:

- avoid trigger foods that include caffeine (in tea, coffee, cola and energy drinks), spicy foods (curries and chillies) and greasy foods (high fat meals, fried foods, fatty meat and oily dishes); and
- eat smaller meals and remain sitting or standing for an hour after meals, as lying down after a meal can trigger reflux.

### Food Cravings?

Cravings are common and can interfere with healthy eating. To help manage them:

- avoid going hungry by eating regular meals and snacks throughout the day; and
- prioritise healthy foods that satisfy cravings (sweet bananas and mango, crunchy nuts, creamy avocado and coconut).

# Special Considerations

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## Hypertension

### What Is It?

Maternal hypertension is the development of hypertension during pregnancy (and includes pre-eclampsia). It is a common condition and can lead to serious health consequences for both the mother and her child, if left untreated. Blood pressure readings of over 140/90mmHg are indicative of hypertension.

### Risk Factors:

Low dietary calcium intake, having a family history of maternal hypertension, having diabetes, being a first-time mother or having twin pregnancies are each risk factors for hypertension.

### Management:

Blood pressure should be checked at all appointments. It is also important to refer mothers for medical management in case they require medication or further care. Eating a healthy diet comprised of a sufficient amount of calcium (through milk and green leafy vegetables and supplements of over 1.5-2 grams of calcium per day for women with low calcium intake)<sup>18</sup>, achieving a healthy level of weight gain and staying active are essential to avoid hypertension during pregnancy. Once diagnosed with hypertension, it is even more important to follow these guidelines, ensure regular physical activity and follow medical advice for its treatment and medication.

## Gestational Diabetes (GDM)

### What Is It?

Gestational Diabetes (GDM) is a temporary condition that results in elevated blood glucose levels during pregnancy. Although symptoms can include thirst, dry mouth, tiredness and frequent urination, often there are no symptoms. Leaving GDM untreated increases the risk of birth complications, high birth weight, premature birth and stillbirth. It also increases the mother's risk of pre-eclampsia and future diabetes. Following dietary guidance for pregnant women can help reduce the risk of GDM.

### Risk Factors:

Obesity, previous macrosomic birth, history of GDM, family history of diabetes and excessive gestational weight gain place mothers at risk of GDM.

**Ensure high-risk mothers are screened for GDM**

For an initial indication, a finger prick blood glucose test can be helpful. A fasting reading of over 7.0 mmol/L, or random glucose reading of over 11.1mmol/L is considered high and should be further investigated with an OGTT.<sup>21</sup>

## Management:

To control GDM:

- follow the general dietary guidance for pregnant women outlined in these guidelines;
- achieve a healthy level of weight gain during pregnancy;
- ensure regular physical activity; and
- adhere to prescribed medication.

Note: Following healthy eating guidance is the best way to prevent and control GDM. There is no indication that a diet that specifically reduces carbohydrates is beneficial.<sup>22,23</sup>

## Vegetarian Mothers:

It is especially important for vegetarian mothers to consume at least three servings of non-meat, body-building foods per day. Tofu, legumes (dahl, lentils, chickpeas and beans), milk, nuts, eggs (if possible), whole meal bread and green leafy vegetables are excellent choices. Taking iron and folic acid supplements is essential.

## Teenage Mothers:

Teen mothers require even more nutrients to meet the needs of their own growing bodies, as well as the needs of their babies. Eating at least three servings of body-building foods per day and consuming at least two glasses of milk per day is important to meet their protein and calcium requirements. Taking iron, folic acid and calcium supplements is required.

# Healthy Eating After Pregnancy and During Breastfeeding

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The bodies of lactating mothers naturally ensure breast milk contains a sufficient amount of nutrients to provide babies with everything they need. However, providing nutrients to the baby takes away nutrients from the mother. If the expectant mother is not eating enough to replenish nutrients provided to the baby, it can put the mother's health at risk. For this reason, healthy eating is just as important after pregnancy.

The same healthy eating guidance for pregnancy is beneficial while breastfeeding. It also remains important to avoid alcohol and to reduce caffeine intake while breastfeeding as these can pass to the baby through breast milk. Nonetheless, some foods (raw fish and fish salad, cold meats and raw egg products, like mayonnaise) can be returned to the menu.

Exclusively means not feeding them any other food or drinks during this 6 months.

**Exclusively  
breastfeeding for  
the first six months  
gives babies the best  
start to life.**

Continuing to consume an extra glass of milk each day will also help provide extra calories and nutrients.

See the *Healthy feeding guidelines for Pacific babies and young children under 5 years old* for more information. If mothers are experiencing challenges with breastfeeding, it is important to arrange help and support for them through a nurse or midwife.

## Staying Active

Steadily increasing physical activity through light exercises, like walking and swimming, is an excellent way to boost mental health and lose any weight gained during pregnancy.

# Summary

Stage of Pregnancy	Priority Areas for Counselling	Servings of Food Groups	
Planning	<p><b>HEALTHY EATING:</b> Follow a healthy diet with body-building foods for iron and calcium, and protective foods for vitamins.</p> <p><b>WEIGHT:</b> Promote a healthy body weight through a healthy diet and regular physical activity.</p> <p><b>SUPPLEMENTS:</b> Commence iron and folate supplements at least three months prior to pregnancy.</p>	<p>5 or more servings of protective foods</p> <p>1-2 portions of body-building foods per day</p> <p>At least 6 servings of energy foods per day</p>	<p><b>FOODS TO PROMOTE:</b></p> <p>Green leafy vegetables (for iron, folate and calcium), orange vegetables or fruits (for vitamins A and C), milk (for protein and calcium), low mercury fish (for protein, iodine and healthy fats), legumes, beans and nuts (for a healthy source of protein), eggs (well cooked) and water</p>
First Trimester (Weeks 0-12)	<p><b>HEALTHY EATING:</b> Provide advice on a healthy dietary pattern and the importance of food safety/avoidance of certain foods.</p> <p><b>HEALTH CHECK:</b> Screen for hypertension, gestational diabetes and anaemia.</p> <p><b>WEIGHT GAIN:</b> Advise that weight gain should begin in the 2<sup>nd</sup> trimester, and that approximately 2000 calories are needed per day.</p> <p><b>SUPPLEMENTS:</b> Provide iron, folate and calcium supplementation (for women with low intake).</p> <p><b>MANAGING SYMPTOMS:</b> Discuss nutritional strategies to manage symptoms (especially nausea).</p>	<p>6 or more servings of protective foods per day</p> <p>3 servings of body-building foods per day</p> <p>4 or more servings of energy foods per day</p>	<p><b>FOODS TO AVOID:</b></p> <p>Alcohol, kava, betel nut, undercooked meat and chicken, raw eggs, raw fish – including fish salad (kokoda, ota ika), soft cheeses, cold meats (ham, cold chicken, luncheon, smoked fish), pre-prepared salads and dips, soft serve ice creams, cream/custard cakes and slices, <u>unwashed</u> fruits, vegetables and root crops</p>
Second Trimester (Weeks 13-26)	<p><b>HEALTHY EATING:</b> Continue healthy eating and food safety, and ensure compliance with recommendations on supplement intake.</p> <p><b>HEALTH CHECK:</b> Screen blood pressure and blood glucose.</p> <p><b>WEIGHT GAIN:</b> Advise on extra calorie requirements (300 calories). Monitor weight gain.</p>		<p><b>ESSENTIAL SUPPLEMENTS:</b></p> <p>All pregnant women require <b>30-60mg iron + 400mg folic acid</b> supplementation every day. If diagnosed with anaemia, this should be increased to 120mg iron + 400mg folic acid per day.</p> <p>Women with low calcium intake should take <b>1.5-2g calcium per day</b>.</p>
Third Trimester (Weeks 27- 40)	<p><b>HEALTHY EATING:</b> Continue healthy eating and food safety, ensure compliance with recommendations on supplement intake.</p> <p><b>WEIGHT GAIN:</b> Advise on extra calorie requirements (450 calories). Monitor weight gain.</p> <p><b>HEALTH CHECK:</b> Screen for hypertension, gestational diabetes and anaemia.</p> <p><b>AFTER PREGNANCY:</b> Discuss the importance of healthy eating and breastfeeding.</p>		
<b>After Pregnancy</b>			
Maintain healthy eating and avoid alcohol, kava and betel nut chewing. Recommend exclusive breastfeeding for the first six months. Suggest slowly increasing physical activity and losing pregnancy-related weight gain.			
<b>Special Conditions</b>			
Maternal Hypertension	Mothers with a low intake of calcium should be prescribed daily calcium supplementation of over 1g/day. Diagnosed mothers should be monitored and prescribed appropriate medication and should both follow the dietary guidance provided for health and maintain regular physical activity.		
Gestational Diabetes	High-risk mothers should have their blood glucose monitored at all appointments. Diagnosed mothers should be monitored and prescribed appropriate medication. These mothers also should follow the dietary guidance provided for health and maintain regular physical activity.		

Stage of Pregnancy	Priority Areas for Counselling	Servings of Food Groups
Managing Symptoms		
Hyperemesis (morning sickness/nausea)	Eat small meals throughout the day (rather than three large meals), including breakfast, avoiding long periods of fasting, and using ginger (in teas or meals).	
Acid Reflux	Avoid trigger foods (caffeine, spicy foods, high fat meals), and avoid eating large meals and lying down immediately after meals.	
Constipation	Eat plenty of fibre-rich fruits, vegetables, legumes, beans and wholegrain cereals. Drink more than 8 glasses of water per day, and ensure daily physical activity.	

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