

**Pregnancy**

Applicable to: Nurses, Physicians and Other Health Professionals

**Recommendations:**

- Women who could become pregnant are encouraged:
  - To eat a variety of food every day and make healthy eating and physical activity part of everyday life.
  - To take a multivitamin and mineral supplement that contains 0.4 mg (400 mcg) of folic acid every day. Women are recommended to start supplementation at a minimum of 3 months prior to conception.
  - To maintain a healthy body weight before and between pregnancies.
- During pregnancy, women are advised to:
  - Eat a variety of foods and follow Canada's Food Guide.
  - Include additional foods every day in the 2nd and 3rd trimesters of pregnancy in amounts appropriate to meet healthy pregnancy weight gain recommendations for their pre-gravid BMI category.
  - Choose a multivitamin and mineral supplement that contains 0.4 mg (400 mcg) folic acid, 16 – 20 mg of iron, vitamin B12, and 400 IU of vitamin D every day.
  - Follow safe food handling practices and avoid foods that increase chances of getting a food-borne illness during pregnancy.
  - Limit caffeine intake to 300 mg per day.
  - Drink 10 cups (2.5 L) of fluid each day. Water is recommended as the main fluid.
- Health care providers are advised to provide pregnant women with nutrition information that will help them make informed choices about:
  - Healthy pregnancy weight gain.
  - Nutrients of special concern during pregnancy (e.g. folic acid, iron, calcium).
  - Nutrient supplements.
  - Beverage and fluid choices.
  - General food safety and food items to limit or avoid during pregnancy.
  - Managing common discomforts of pregnancy (e.g. nausea and vomiting of pregnancy).
- Referral for nutrition assessment/counselling by a Registered Dietitian is appropriate for women who:
  - Are adolescents.
  - Are pregnant with twins, triplets or higher order multiples.
  - Previously had a low birth weight infant.
  - Had a low pre-pregnancy BMI.
  - Have a poor weight gain in the 2nd or 3rd trimester.
  - Have a nutrition-related health condition, such as: inflammatory bowel disease (IBD), post-bariatric surgery, celiac disease, gestational diabetes, pre-eclampsia, or other.

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### Scope of this Guideline

The scope of this guideline covers the following:

- Women who could become pregnant.
- Women pregnant with singletons.
- All ages of pregnant women, including adolescents.

Some expectant parents may not identify as women or as female, but as male, non-binary, or gender diverse. In all circumstances, health care providers shall utilize patient and family centred care to be responsive to the particular context, self-identified gender, pronouns, and preferred terminology of the families they support.

Additional information for the following specific populations may be found here:

- [Nutrition Guideline: Diabetes in Pregnancy](#).
- [Nutrition Guideline: Pregnancy: Multiples](#).

### Definitions

**Congenital anomalies:** Anomalies, either structural or functional (e.g. metabolic disorders) that occur during gestation. Also known as birth defects, congenital disorders or congenital malformations.<sup>(1)</sup>

**Cultural competence:** The ability for health care systems and practitioners to provide high quality, safe, client-centred care to clients with a wide range of unique values, beliefs and behaviours.<sup>(2)</sup>

**Fortified:** Fortification refers to “the addition of one or more vitamins or minerals to a food product”.<sup>(3)</sup>

**Gestational hypertension:** First onset of hypertension after 20 weeks gestation (diastolic blood pressure >90mm Hg or systolic blood pressure >140 mm Hg).<sup>(4-6)</sup>

**Herbal teas:** These are beverages made with fresh or dried flowers, leaves, seeds or roots from many different kinds of plants. Climate, growing conditions, storage conditions and processing (e.g. extraction and drying) can influence content and concentration.<sup>(7)</sup>

**Intrauterine growth restriction (IUGR):** Fetus with an estimated fetal weight <10<sup>th</sup> percentile on ultrasound, that, because of a pathological process, has not attained its biologically determined growth potential.<sup>(8)</sup>

**Large for gestational age (LGA):** Weight above the 90<sup>th</sup> percentile for gestational age.<sup>(9)</sup>

**Low birth weight (LBW):** A baby that weighs less than 2500 grams at birth. A baby may weigh less than 2500 grams at birth because it is born too soon or because it is small for its gestational age.<sup>(10)</sup>

**Miscarriage:** loss of a pregnancy before fetal viability.<sup>(11)</sup> Fetuses that die in utero before 20 weeks gestation are categorized as miscarriages.<sup>(12)</sup>

**Multivitamin supplement:** Terminology used to describe a supplement containing multiple vitamins and minerals. The terminology *prenatal multivitamin* is not used due to the wide variation in supplements available for pregnant women.

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**Natural product number (NPN):** An eight (8) digit numerical code assigned to each natural health product approved to be marketed under the Natural Health Products Regulations.<sup>(13)</sup>

**Neonatal death:** Infant death within the first 27 days of life.<sup>(14)</sup>

**Nutrient dense:** Relatively rich in nutrients for the number of calories the food contains.

**Perinatal:** The perinatal period commences at 22 completed weeks (154 days) of gestation and ends seven completed days after birth.<sup>(10)</sup>

**Phytates:** Antioxidant compounds found in whole grains, legumes, nuts and seeds. Phytates can bind to dietary minerals iron, zinc, manganese and, to a lesser extent calcium, and slow their absorption.<sup>(15)</sup>

**Plant-based beverage:** A beverage made from plant bases such as soy, rice, almond, etc.<sup>(16)</sup>

**Preterm birth:** Defined as birth before 37 weeks of gestation. <sup>(11)</sup>

**Pre-eclampsia:** Hypertension that develops during gestation with proteinuria and/or one or more adverse conditions or severe complications (i.e. maternal symptoms, maternal signs of end-organ dysfunction, abnormal maternal laboratory testing, fetal morbidity).<sup>(6,17,18)</sup>

**Pre-existing hypertension:** High blood pressure that develops either pre-pregnancy or at <20 weeks gestation.<sup>(4-6)</sup>

**Probiotics:** Live microorganisms (bacteria or yeast) which, when administered in adequate amounts, confer a health benefit on the host.<sup>(19)</sup> Probiotics are labelled by genus, species, and strain.

**Regular teas:** These are beverages made from the shrub *Camellia sinensis*. Some examples of teas are: black, white, green, oolong, jasmine, Formosa, Ceylon, India, and Darjeeling.<sup>(20)</sup>

**Small for gestational age (SGA):** Weight below 10th percentile for gestational age.<sup>(21)</sup>

**Spontaneous abortion:** A clinically recognized pregnancy loss before the 20th week of gestation. Also known as miscarriage.<sup>(22)</sup>

**Stillbirth:** The term used to describe fetal deaths at 20 weeks gestation or more.<sup>(12)</sup> The World Health Organization defines stillbirth as at or after 28 weeks gestation.<sup>(23)</sup>

**Very-low birth weight:** Birth weight less than 1500 grams (up to and including 1499 grams), regardless of gestational age.<sup>(24)</sup>

## Health Benefits

In North America it is estimated that approximately one half of pregnancies are unplanned.<sup>(21)</sup> It is recommended that all women who could become pregnant maintain good nutrition. Pregnancy is a critical period in a woman's life that can influence short and long-term health of both the mother and infant.

The health benefits of good maternal nutrition intake during pregnancy include:

- Reducing the risk of neural tube defects.<sup>(25)</sup>
- Reducing the risk of low-birth weight infants, small for gestational age infants and preterm births.<sup>(25)</sup>
- Reducing the risk of chronic health problems in both the mother and child.<sup>(5)</sup>

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Components contributing to a healthy pregnancy outcome include:<sup>(5,21,26)</sup>

- Healthy pre-pregnancy weight.
- Appropriate pregnancy weight gain based on body mass index category.
- Consumption of a wide variety of nutrient dense foods.
- Appropriate vitamin and mineral supplementation.
- Safe food handling and food choices.
- Early intervention for women with higher nutrient needs.
- Avoidance of alcohol and other harmful substances.

### Key Questions

#### [Weight Gain in Pregnancy \(page 6\)](#)

How does maternal weight affect pregnancy outcomes?

How much weight gain is appropriate during pregnancy?

Is weight loss ever recommended during pregnancy?

#### [Healthy Eating during Pregnancy \(page 7\)](#)

Do women need to eat more during pregnancy?

What nutrients are important during pregnancy?

- Folic acid
- Calcium and vitamin D
- Iron
- Omega-3 fatty acids
- Choline and iodine

#### [Vegetarian Eating Patterns during Pregnancy \(page 18\)](#)

Are there any extra considerations for vegetarian eating patterns?

#### [Nutrient Supplements during Pregnancy \(page 20\)](#)

What are the recommendations for a multivitamin supplement for pregnancy?

What is the difference between a multivitamin and a “prenatal vitamin”?

Are there benefits of taking a multivitamin compared to single nutrient supplements?

What if a pregnant woman requires higher amounts of iron or folic acid?

#### [Other Nutrient Supplements \(page 21\)](#)

Is the use of Lucky Iron Fish™ recommended to improve iron status in pregnant women?

What advice can be given to pregnant women about omega-3 fatty acid supplements?

Do women require a protein supplement during pregnancy?

What is the concern with vitamin A supplements in pregnancy?

What about the use of other supplements during pregnancy?

#### [Beverage and Fluid Intake during Pregnancy \(page 23\)](#)

How much fluid does a pregnant woman need?

What is a plant-based beverage and are they a nutritious choice for pregnant women?

What is considered a safe intake of caffeine during pregnancy?

What is the recommendation for caffeinated energy drinks during pregnancy?

Are sugary drinks recommended during pregnancy?

What herbal teas are considered safe to consume during pregnancy?

Do women need nutrition supplement drinks during pregnancy?

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### [Food Safety during Pregnancy \(page 27\)](#)

What is the concern about foodborne illness during pregnancy?

What is the best way to reduce the risk of foodborne illness during pregnancy?

What foods are women advised to avoid during pregnancy and are there safer alternatives?

Is it safe for pregnant women to consume fish?

What are the food safety concerns with cheese and what are safe cheese choices?

Other food-related safety considerations

### [Common Discomforts of Pregnancy Considerations \(page 33\)](#)

Nausea and vomiting – what can be done during pregnancy?

Constipation – what can be done during pregnancy?

Heartburn – what can be done during pregnancy?

### [Health Condition Considerations in Pregnancy \(page 35\)](#)

Are there special nutritional considerations regarding diabetes in pregnancy?

Are there nutritional considerations for hypertensive disorders of pregnancy?

Are there recommended foods to avoid or eat during pregnancy to prevent infant allergies?

### [Adolescent Pregnancy \(page 37\)](#)

What are the nutrients of concern for adolescent pregnancy?

What are the recommendations for gestational weight gain in adolescents?

### [Substance Use during Pregnancy \(page 39\)](#)

Is it safe for pregnant women to consume alcohol?

Is it safe for pregnant women to consume cannabis?

### [Physical Activity during Pregnancy \(page 39\)](#)

What needs to be considered when discussing physical activity during pregnancy?

### [Other Special Considerations \(page 40\)](#)

Are there special considerations when working with pregnant women with culturally diverse backgrounds?

### [Referral to a Registered Dietitian \(Page 41\)](#)

When is referral to a Registered Dietitian recommended?

### [Resources \(page 42\)](#)

What resources are available for professionals?

What resources are available for the public?

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### Weight Gain in Pregnancy

[Return to Key Questions](#)

#### How does maternal weight affect pregnancy outcomes?

Weight gain is a normal and important part of a healthy pregnancy.<sup>(27)</sup> Appropriate maternal weight gain reduces the risk of complications during pregnancy and at delivery, and promotes the long-term health of both mother and child.<sup>(21)</sup>

A woman who does not gain enough weight during pregnancy is at greater risk of having a low birth weight baby and is also at increased risk of pre-term delivery.<sup>(21)</sup> Dieting and weight loss are not recommended during pregnancy.<sup>(27,28)</sup>

Excessive weight gain in pregnancy is a growing concern. Studies of pregnant women in Alberta have documented that approximately half (49%) of women gained weight in excess of guidelines.<sup>(29)</sup> Women who gain excess amounts of weight are at increased risk for pre-eclampsia, gestational diabetes, pre-term delivery, caesarean section delivery, and retaining extra weight after delivery.<sup>(21)</sup> Maternal obesity and excessive weight gain during pregnancy is also associated with large-for-gestational-age infants.<sup>(21)</sup> These infants are at increased risk for childhood obesity.<sup>(21)</sup>

#### How much weight gain is appropriate during pregnancy?

As early in pregnancy as possible, assess women's pre-pregnancy BMI and provide an individualized weight gain recommendation based on Health Canada guidelines.<sup>(21)</sup> Appropriate ranges of weight gain differ between categories of pre-pregnancy BMI, as outlined in [Table 1](#).<sup>(21)</sup> Minimal weight gain is required in the first trimester of pregnancy for singleton pregnancies, only 0.5 – 2.2 kg (1.1 – 4.4 pounds). Average weekly rate of weight gain for the second and third trimesters ranges from 0.2 – 0.5 kg per week (0.5 – 1.1 pounds per week) depending on the woman's pre-pregnancy BMI category.

Monitor weight gain and review progress with pregnant women regularly to help them gain within their target range.<sup>(21,30)</sup> Alberta Health Services has Pregnancy Weight Gain Graphs for Singletons that can be used for monitoring weight gain.<sup>(31)</sup>

**Table 1. Canadian Gestational Weight Gain Recommendations for Singletons**

Pre-pregnancy BMI	Recommended Range of Total Weight Gain During Pregnancy		Average <u>Weekly</u> Rate of Weight Gain in Second and Third Trimesters
	Kilograms (kgs)	Pounds (lbs)	
BMI <18.5 Underweight	12.5 – 18	28 – 40	0.5 kg (1.1 lb)
BMI 18.5 – 24.9 Normal weight	11.5 – 16	25 – 35	0.4 kg (0.9 lb)
BMI 25.0 – 29.9 Overweight	7 – 11.5	15 – 25	0.3 kg (0.6 lb)
BMI ≥30 Obese	5 – 9	11 – 20	0.2 kg (0.5 lb)

Source: Table S 1, New Recommendations for Total and Rate of Weight Gain during Pregnancy, by Prepregnancy BMI, Weight Gain During Pregnancy: Reexamining the Guidelines. Institute of Medicine (US) and National Research Council (US) Committee to Reexamine IOM Pregnancy Weight Guidelines; Rasmussen KM, Yaktine AL, 2009<sup>(30)</sup>

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Further assessment and follow up is warranted for women who are gaining weight outside of the recommendations.<sup>(21)</sup> Encourage women to identify and implement practical, sustainable healthy behaviours to meet weight gain recommendations.<sup>(21)</sup> Consider the social determinants of health when counselling women, as these can impact weight gain in pregnancy.<sup>(21)</sup> Women who have already surpassed the recommended weight gain can be encouraged to continue gaining weight at the appropriate rate of gain according to their pre-pregnancy BMI.<sup>(27)</sup> Women who are gaining too much or not enough weight in pregnancy can be referred to a Registered Dietitian for assessment and counselling.<sup>(27)</sup>

See also: [When is referral to a Registered Dietitian recommended?](#)  
[What resources are available for health professionals?](#)

For related Nutrition Guidelines see: [Nutrition Guideline: Pregnancy: Multiples](#)

#### Is weight loss ever recommended during pregnancy?

Weight loss during pregnancy is not recommended for women in any pre-pregnancy BMI category, including women who have a high pre-pregnancy BMI. Women in the BMI category  $\geq 30$  prior to pregnancy who experience weight loss during pregnancy are at increased odds of delivering small-for-gestational age (SGA) infants.<sup>(21)</sup> It is recommended that women follow a weekly rate of weight gain according to their pre-pregnancy BMI.<sup>(27)</sup>

#### Healthy Eating during Pregnancy

[Return to Key Questions](#)

#### Do women need to eat more food during pregnancy?

Pregnant women only need modest increases in calories during pregnancy to support their baby's growth and development. In the first trimester, no additional calories are required for most women.

Additional food is recommended, for women of any pre-pregnancy BMI category, in the second and third trimester. Women with a pre-pregnancy BMI between 18.5 – 24.9 will require additional energy requirements of approximately 350 calories for the second trimester and 450 calories for the third trimester.<sup>(32)</sup> Advise women that this is a small amount of additional food, equivalent to a large snack or a small meal. The examples below demonstrate 350 – 450 calories from a variety of healthy food choices:

- A fruit parfait containing yogurt (175 g or 3/4 cup), with chopped walnuts (30 mL or 2 Tbsp.) and sliced banana (125 mL or 1/2 cup) will provide about 350 calories.
- Salmon salad containing canned salmon (75 g or 2.5 oz) with mayonnaise (15 mL or 1 Tbsp.) on whole grain crackers (6 crackers) and 2% milk (250 mL or 1 cup) and a pear (one medium) will provide about 450 calories.

Additional examples of appropriate snacks to meet additional food requirements are available from [Healthy Parents](#), [Healthy Children](#).

Note that individual energy requirements will vary based on age, pre-pregnancy BMI and activity level. Women entering pregnancy with a BMI  $< 18.5$  may require additional food to meet weight gain recommendations. Women entering pregnancy with a BMI  $\geq 25.0$  may require less additional food to meet their recommended weekly and total weight gain targets. Consider recommending individual consultation with a Registered Dietitian if there is concern about caloric intake and food choices.

See also: [How much weight gain is appropriate during pregnancy?](#)  
[When is referral to a Registered Dietitian recommended?](#)

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### What nutrients are important during pregnancy?

Pregnancy is a period of accretion of maternal tissues including the uterus, breasts, blood, extravascular fluids and maternal fat stores, as well as the development of the fetus and placenta.<sup>(21)</sup> The recommendations for many nutrients are higher during pregnancy.<sup>(21)</sup>

The following table summarizes key nutrients of special concern for all women in Canada, including pregnant women. These nutrients include calcium, vitamin D, iron, vitamin A, vitamin B12, folate, omega-3 fatty acids, choline, iodine, and fibre.

**Table 2. Recommended Daily Amounts of Nutrients for Pregnant Women from All Sources (food, multivitamin supplement, single source supplement)**

Nutrient	Adult Pregnancy (19 - 50 years)	Upper Limit (UL)
Calcium	1000 mg <sup>a</sup>	Total daily intake not to exceed 2500 mg <sup>a</sup>
Choline	450 mg <sup>a</sup>	Total daily intake not to exceed 3.5 g <sup>a</sup>
Folate/Folic Acid	0.6 mg (600 mcg) with 0.4 mg (400 mcg) to come from a supplement <sup>a</sup>	1 mg (1000 mcg <sup>a</sup> ) The UL for folate applies only to synthetic forms obtained from supplements, fortified foods, or a combination of the two <sup>a</sup>
Iodine	0.22 mg (220 mcg) <sup>a</sup>	Total daily intake not to exceed 1.1 mg (1100 mcg) <sup>a</sup>
Iron	27 mg <sup>a</sup>	Total daily intake not to exceed 45 mg <sup>b</sup>
Omega-3 Fatty Acids (DHA and EPA)	Include at least 150 grams (5 ounces) of cooked fish rich in omega 3 fatty acids and low in mercury each week during pregnancy <sup>c</sup>	Safe upper limit not defined <sup>c</sup>
Vitamin A	770 mcg <sup>a</sup> (2567 IU)	3000 mcg per day (10,000 IU per day). UL is for preformed vitamin A only <sup>a</sup>
Vitamin B12	2.6 mcg <sup>a</sup>	Safe upper limit not defined <sup>a</sup>
Vitamin D	600 IU <sup>b</sup>	Total daily intake not to exceed 4000 IU <sup>b</sup>

Sources:

<sup>a</sup> Health Canada, 2010. Dietary Reference Intake Tables<sup>(33)</sup>

<sup>b</sup> IOM 2010<sup>(34)</sup>

<sup>c</sup> Health Canada, 2009. Prenatal Nutrition Guidelines for Health Professionals: Fish and Omega-3 Fatty Acids<sup>(35)</sup>

Consider recommending individual consultation with a Registered Dietitian if there is concern about adequate nutrient intakes during pregnancy.

See also: [When is referral to a Registered Dietitian recommended?](#)

### Folate (Folic Acid)

Folate is a B vitamin essential for the development of the spine, brain, and skull of the fetus during the first four weeks of pregnancy.<sup>(36)</sup> Adequate folate has been shown to reduce the risk of neural tube defects (NTD).<sup>(37,38)</sup> Folic acid, folacin and folate are all forms of the same B vitamin. Folate refers to what is naturally found in foods. Folic acid refers to supplements and fortified sources.<sup>(16)</sup>

Due to the high prevalence of unintended pregnancies, folic acid supplementation is recommended for all women who could become pregnant. The benefits of folic acid are highest in the very early weeks of pregnancy, when women often do not know they are pregnant.<sup>(36,38,39)</sup> Women of reproductive age who could become pregnant are recommended to consume folate-rich foods and take a multivitamin supplement that provides 0.4 mg (400 mcg) of folic acid in it every day.



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Women who are planning for pregnancy and not taking a multivitamin supplement containing folic acid are recommended to take a multivitamin supplement with 0.4 mg (400 mcg) folic acid in it every day, starting at least three months before conception.<sup>(21,36,39)</sup> Women are recommended to continue with 0.4 mg (400 mcg) of folic acid supplementation as part of their multivitamin supplement that contains iron, vitamin D and vitamin B12 throughout their pregnancy.<sup>(21)</sup>

More than 1 mg (1000 mcg) of folic acid per day or more than one daily dose of a multivitamin supplement is not recommended for women at low risk of NTDs. <sup>(21)</sup>

See also: [Women who may require higher folic acid supplementation.](#)

**Table 3. Food Sources of Folate (Folic Acid)**

Very high source (≥55 mcg per serving)	High source (>33 mcg per serving)	Source (>11 mcg per serving)
<b>Vegetables and Fruits</b> Asparagus Avocado Beets Broccoli (cooked) Brussels sprouts Collards Endive French beans Green snap peas Papaya Romaine lettuce Seaweed Spinach <b>Grains</b> Enriched pasta Wheat germ  <b>Protein Foods</b> Black beans Chickpeas Kidney beans Lentils Navy beans Pinto beans Peanuts Soybeans Sunflower seeds White beans	<b>Vegetables and Fruits</b> Canned beets Bok choy Butterhead lettuce Green peas Okra Oranges Orange juice Parsnips  <b>Grains</b> Enriched bread (look for 15% DV for folate) Enriched cereal Enriched crackers  <b>Protein Foods</b> Eggs Fortified white flour	<b>Vegetables and Fruits</b> Arugula Bananas Broccoli (raw) Cabbage Carrots Cauliflower Dandelion greens (raw) Kale (raw) Leeks Lettuce (iceberg, loose leaf, radicchio, red leaf) Pineapple Potatoes Rutabaga Snap beans Snow peas Strawberries Tomatoes  <b>Grains</b> Wild rice  <b>Protein foods</b> Cottage cheese Lima beans Milk Tofu Pistachio nuts Sesame seeds Walnut Yogurt

Source: Health Canada. Canadian Nutrient File, Version 2015 <sup>(40)</sup> and the nutrient claims per Canada's Food Guide servings

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All women who could become pregnant are advised:

- To choose folate-rich food choices.
- To take a multivitamin supplement with 0.4 mg (400 mcg) folic acid in it.

All pregnant women are advised:

- To choose folate-rich food choices.
- To take a multivitamin supplement with 0.4 mg (400 mcg) of folic acid in it during their entire pregnancy and for as long as breastfeeding continues.

#### Women Who May Require Higher Folic Acid Supplementation

Women are encouraged to talk to their health care provider about the amount of folic acid that is right for them before they start trying to become pregnant.

Women with certain health risks are recommended to take higher doses of folic acid supplementation of 1 mg (1000 mcg) prior to conception and for the first 12 weeks of pregnancy.<sup>(39)</sup> These health conditions requiring higher folic acid supplementation include, but are not limited to:

- Pre-existing diabetes.
- Obesity.
- Advanced liver disease.
- Alcohol overuse.

In addition, pregnant women who have an increased risk of a pregnancy affected by NTD need to discuss with their doctor the adequate dosage of folic acid as they require higher doses of folic acid prior to and during their first trimester.<sup>(39)</sup> Women at high risk for NTDs include women with:<sup>(39)</sup>

- Previous pregnancy affected with NTD.
- Personal or male partner family history of NTD.
- Personal or family history of other folic acid related congenital anomalies, e.g. cleft palate.

Pregnant women with a higher risk of a pregnancy affected by NTD's are advised:

- To choose folate-rich food choices from Canada's Food Guide.
- To discuss with their doctor about adequate dosage of folic acid supplementation if they have additional health risks or have a higher risk of a pregnancy affected by NTD.

#### Calcium and Vitamin D

Calcium is a mineral that has a key role as a structural component of bones and teeth. It is also important for proper muscle function, nerve activity and hormone secretion.<sup>(34)</sup> Vitamin D is a fat-soluble vitamin that has important roles in many body functions, including facilitating intestinal absorption of calcium and supporting the delivery and utilization of calcium in bone and teeth formation and nerve and muscle activity.<sup>(34)</sup> In pregnant women, calcium and vitamin D are also needed for the growth and development of the skeletal tissue of the fetus.<sup>(41)</sup> During pregnancy, intestinal absorption of calcium is increased and maternal bone calcium mobilization is optimized.<sup>(5,41)</sup>

Due to physiological changes occurring during pregnancy, requirements of calcium and vitamin D remain the same as non-pregnant women.<sup>(41)</sup> Adult pregnant women need a total of 1,000 mg of calcium and 600 IU of vitamin D daily to meet their requirements.<sup>(5)</sup> Evidence of calcium and vitamin D supplementation above these levels during pregnancy to improve maternal and neonatal outcomes has been inconclusive.<sup>(37,38,41)</sup>

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### Calcium

Adequate calcium intake during pregnancy can be achieved by including calcium rich foods and eating a variety of foods as recommended by Canada's Food Guide. The best food sources of calcium are dairy foods, including milk, yogurt and cheese. Some calcium is provided in most multivitamin supplements.

Table 4. Food Sources of Calcium

Very high source (≥ 275 mg per serving)	High source (≥ 165 mg per serving)	Source (≥ 55 mg per serving)
<b>Protein Foods</b> Cheese, hard (e.g. cheddar, Colby, Swiss) Cheese, Parmesan (hard, shredded, grated) Cow's milk, fluid (e.g. skim, 1%, 2%, lactose-free) Cow's milk, powdered (e.g. skim, 2%) Plant-based beverage*, fortified with calcium (e.g. fortified soy beverage) Sardines, cooked or canned with bones Soup made with cow's milk Tofu, made with calcium	<b>Protein Foods</b> Almond butter Kefir Salmon, cooked or canned with bones Yogurt  <b>Other Foods</b> Blackstrap molasses	<b>Vegetables and Fruit</b> Bok choy Calcium-fortified orange juice Collard greens Turnip greens  <b>Protein Foods</b> Almonds Brazil nuts Sesame butter (tahini) Cottage cheese, made from pasteurized milk Milk pudding Navy beans Soybeans White beans

Source: Health Canada, Canadian Nutrient File, Version 2015<sup>(40)</sup> and the nutrient claims per Canada's Food Guide servings

\* May also include almond, cashew or rice - if fortified

Women who do not consume milk, yogurt, cheese or calcium-fortified plant based beverages are at risk of not meeting calcium recommendations; an additional calcium supplement may be required. Women who are taking single dose calcium supplements are advised to take them in amounts that do not exceed 500 mg at a time.<sup>(5,21,42,43)</sup> Calcium supplements are best taken separately from multivitamin supplements containing iron (at least 2 hours between) due to the potential of calcium and iron competing for absorption.<sup>(44)</sup> Single nutrient supplementation is best advised by a Registered Dietitian, who will base recommendations on individual client assessment. Calcium intake, from food, supplements, and medication (calcium based antacids) is not to exceed the upper limit (UL) of 2500 mg per day.<sup>(43)</sup>

See also: [What are the food safety concerns with cheese and what are safe cheese choices?](#)  
[What is a plant-based beverage and are they a nutritious choice for pregnant women?](#)

### Vitamin D

Food sources of vitamin D are primarily vitamin D fortified fluid cow's milk or plant-based beverages fortified with vitamin D. Other dietary sources of vitamin D are limited.<sup>(21)</sup> Adequate intake of vitamin D during pregnancy can be achieved by drinking a minimum of 2 cups (500 mL) of fluid cow's milk or vitamin D fortified plant-based beverage daily in addition to a multivitamin supplement dose that contains 400 IU of vitamin D. The UL for vitamin D intake from food and supplement sources is 4000 IU per day.<sup>(34)</sup>

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Table 5. Food Sources of Vitamin D

Very high source ≥200 IU per serving	High source ≥100 IU per serving	Source ≥50 IU per serving
<b>Protein Foods</b> Fish <ul style="list-style-type: none"> <li>• Herring</li> <li>• Rainbow trout</li> <li>• Salmon(farmed and wild)</li> </ul>	<b>Protein Foods</b> Cow's milk, all types, fortified with vitamin D (e.g. skim, 1%, 2%, lactose-free) Cow's milk, evaporated, undiluted Fish <ul style="list-style-type: none"> <li>• Halibut</li> </ul> Skim milk powder	<b>Protein Foods</b> Anchovies Eggs Fish <ul style="list-style-type: none"> <li>• Atlantic mackerel</li> <li>• Hake</li> <li>• Sardines</li> </ul> Yogurt**, fortified with vitamin D  <b>Other foods</b> Margarine Plant-based beverages*, fortified with vitamin D (e.g. fortified soy beverage).

Source: Health Canada. Canadian Nutrient File, Version 2015<sup>(40)</sup>

Note: Vitamin D levels in fish vary. For example, farmed salmon has less vitamin D than wild salmon.

\* May also include almond, cashew or rice - if fortified.

\*\*Not all yogurt brands are fortified. Amount of vitamin D varies between brands.

See also: [Is it safe for pregnant women to consume fish?](#)

In summary, the IOM recommends pregnant adults (19 to 50 years of age) obtain the following daily amounts of calcium and vitamin D from all sources (food and supplements):<sup>(34)</sup>

- 1000 mg per day of calcium.
- 600 IU per day of vitamin D.

All adult pregnant women are advised:

- To include calcium and vitamin D food sources, particularly the consumption of at least 2 cups (500 mL) of fluid milk or fortified plant-based beverages daily.
- To take a multivitamin supplement every day that contains 400 IU of vitamin D.
- To not exceed the UL of 2500 mg calcium and 4000 IU vitamin D, especially from supplement sources.

### Who may be at risk for inadequate intakes or have higher requirements for calcium and vitamin D

Pregnant women following vegan diets, women with highly pigmented skin, limited sun exposure and in northern latitudes are at higher risk of vitamin D deficiency.<sup>(5,21,37,38)</sup> In addition, pregnant women with obesity, suffering from inflammatory disease, or have undergone gastric bypass surgery, may have impaired absorption of this fat-soluble vitamin and screening for vitamin D deficiency may be necessary.<sup>(21)</sup> Adolescents and women who have undergone gastric bypass surgery have higher calcium requirements.<sup>(21)</sup> In addition, women who do not consume at least 2 cups (500 ml) of fluid cow milk or fortified plant-based beverage per day may be at risk for inadequate calcium and vitamin D intakes.

See also: [What are the nutrients of concern for adolescent pregnancy?](#)

# Nutrition Guideline

## Pregnancy

### Iron

Iron is a mineral that has many roles in the body, including functioning as a component of a number of proteins, notably hemoglobin.<sup>(45)</sup> Low hemoglobin levels in pregnancy are associated with increased risks of preterm birth,<sup>(46)</sup> low birth weight,<sup>(46,47)</sup> and small for gestational age infants.<sup>(46)</sup> Additional iron is needed during pregnancy to increase the maternal red blood cell mass and to supply the growing fetus and placenta.<sup>(48)</sup>

The recommended daily allowance (RDA) for iron during pregnancy is 27 mg per day, an increase of 9 mg per day over requirements for non-pregnant females aged 19 – 50.<sup>(45)</sup> The UL for iron is 45 mg per day.<sup>(44)</sup> Pregnant women who are being treated for iron deficiency anemia may be treated with higher doses of iron above the UL.<sup>(21)</sup>

Pregnant women are advised to meet recommended iron requirements by choosing iron-rich foods from Canada's Food Guide and taking a multivitamin supplement containing 16 – 20 mg iron every day.<sup>(48)</sup> If a woman is taking single dose calcium supplements, these are best taken separately from multivitamin supplements containing iron (at least 2 hours between) due to the potential of calcium and iron competing for absorption.<sup>(44)</sup> Multivitamin supplements containing iron are usually a once daily dose. Women are advised to taken them as recommended on the product package.

Dietary iron is found in foods in both heme iron and non-heme iron forms. Heme iron is better absorbed than non-heme iron.<sup>(48)</sup> Only meat (beef, pork, lamb, elk, deer, etc.), poultry (chicken, turkey), fish and seafood contain heme iron. Non-heme iron is found in meat, poultry and fish, as well as in eggs and plant-based foods such as tofu (medium or firm), legumes (such as kidney beans, lentils, and chickpeas), nuts and seeds and grains products. Some food products, including ready-to-eat cold cereal, are enriched with iron.

**Table 6. Food Sources of Iron**

Very high source (≥3.5 mg per serving)	High source (≥2.1 mg per serving)	Source (≥0.7 mg per serving)
<b>Grains</b> Cold cereal, enriched Instant hot cereal, enriched, cooked <b>Protein Foods</b> Chickpeas Lentils Liver Moose Mussels or Oysters Pumpkin seeds Wild duck <b>Other Foods</b> Blackstrap molasses	<b>Protein Foods</b> Beef Clams Elk Kidney beans Soybeans Tofu Venison	<b>Grains</b> Pasta, enriched Oatmeal  <b>Protein Foods</b> Almond, cashew, peanut butter Canned light tuna Chicken Eggs Lamb Pork Sardines

Source: Health Canada, Canadian Nutrient File, Version 2015 <sup>(40)</sup> and the nutrient claims per Canada's Food Guide servings.

\* May also include almond, cashew or rice - if fortified

The absorption of non-heme iron from foods is improved when foods rich in vitamin C are consumed at the same time.<sup>(44)</sup> In addition, absorption of non-heme iron from food high in phytates (e.g. soybeans, black beans, lentils, split peas) improves when these foods are soaked overnight in water or sprouted.<sup>(49)</sup>

## Nutrition Guideline

### Pregnancy

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Table 7. Food Sources of Vitamin C

Broccoli	Oranges
Cantaloupe	Potatoes
Grapefruit	Strawberries
Kiwi	Sweet peppers
Mango	Tomatoes

Source: Health Canada. Canadian Nutrient File, Version 2015. <sup>(40)</sup>

All pregnant women are advised:

- To follow Canada's Food Guide.
- To consume foods rich in both heme and non-heme iron.
- To consume foods rich in non-heme iron together with foods with vitamin C.
- When choosing a multivitamin supplement, look for one that provides 16 – 20 mg of iron per daily dose.

Consider recommending individual consultation with a Registered Dietitian if there is concern about iron intake from food choices.

See also: [What resources are available for the public?](#)

#### Women who may require higher doses of supplemental iron

Pregnant women who have an increased risk of iron deficiency during pregnancy need to discuss with their doctor the adequate dosage of supplemental iron as they may require doses of iron higher than 16–20 mg per day. Therapeutic doses of iron may be required for women demonstrating biochemical evidence of iron deficiency (low hemoglobin levels; low serum ferritin levels).<sup>(21)</sup> Individualization of treatment with a physician is recommended for women who require therapeutic doses of iron. Treatment typically includes decisions regarding the type (e.g. liquid, pill), mode of administration (e.g. oral, intravenous) and formulation (e.g. sulphate, fumarate or gluconate), of iron.<sup>(50)</sup>

Women at higher risk for iron deficiency during pregnancy include adolescents and refugees or immigrants from low income countries, as well as women with:<sup>(21)</sup>

- Low or no intake of meat (beef, pork, wild game), fish and poultry.
- Significant blood loss due to menstruation prior to pregnancy.
- Low socioeconomic status.

Review recommendations for fluid and fibre intakes for women taking therapeutic doses of supplemental iron in order to minimize risks of constipation.<sup>(51)</sup>

Pregnant women with a higher risk of iron-deficiency during pregnancy are advised:

- To choose iron-rich food choices from Canada's Food Guide.
- To discuss adequate dosage of iron supplementation with their doctor.

See also: [When is referral to a Registered Dietitian recommended?](#)  
[What are the nutrients of concern for adolescent pregnancy?](#)  
[Constipation – what can be done in pregnancy?](#)

## Nutrition Guideline

### Pregnancy

#### Omega-3 Fatty Acids

Omega-3 fatty acids are polyunsaturated fatty acids. Scientific research has focused on the association between higher intakes of these nutrients and a number of health outcomes. Current research is investigating the relationship between DHA intake during pregnancy and early infancy and early neurodevelopment of the infant.<sup>(52,53)</sup> Omega-3 fatty acids include:

- Alpha-linolenic acid (ALA).
- Eicosapentaenoic acid (EPA).
- Docosahexaenoic acid (DHA).

EPA and DHA are primarily found in fish, shellfish, fish oil supplements, and omega-3 enriched eggs.<sup>(54)</sup> ALA is found in plant sources such as walnuts, flaxseed, canola, and soybean oils.<sup>(54)</sup> ALA is converted to EPA and DHA in humans, but the amount of ALA converted is very low.<sup>(21,54)</sup> The majority of the documented health benefits of omega-3 fatty acids are from research conducted on EPA and DHA rather than from plant-derived ALA.<sup>(54,55)</sup>

The IOM has not set a recommendation for DHA or EPA intake.<sup>(55)</sup> Dietitians of Canada and the Academy of Nutrition and Dietetics recommend 500 mg per day of DHA and EPA for healthy individuals.<sup>(56)</sup> DHA is difficult to get from foods other than fish or DHA-supplemented food.<sup>(21)</sup> Pregnant women are advised to choose fish that are high in EPA and DHA and low in mercury.<sup>(35)</sup> Fish that meet these recommendations include herring, Atlantic mackerel, salmon, sardines and rainbow trout.<sup>(35)</sup>

**Table 8. Low Mercury Food Sources of Omega-3 Fatty Acids**

High Source	DHA and EPA	ALA
Ground flaxseeds		✓
Herring	✓	
Mackerel, Atlantic	✓	
Rainbow Trout	✓	
Salmon, Atlantic	✓	
Walnuts		✓
Source	DHA and EPA	ALA
Canola oil <sup>a</sup>		✓
Clams	✓	
Naturegg™ Omega-3 - 1 large egg (53 g) <sup>b</sup>	✓	✓
Naturegg™ Omega Plus™ - 1/4 cup (63 g) <sup>b</sup>	✓	✓
Sardines	✓	
Shrimp	✓	
Tuna, light	✓	

Source: <sup>a</sup> Health Canada. Canadian Nutrient File, Version 2015. <sup>(40)</sup>

<sup>b</sup> Burnbrae Farms <sup>(57,58)</sup>

Note: Farmed and wild fish may have different amounts of DHA/EPA.

All pregnant women are advised:

- To consume cooked fish rich in omega-3 fatty acids and low in mercury.
- To aim to include at least 150 grams (5 ounces) of fish a week.

See also: [Is it safe for pregnant women to consume fish?](#)  
[What advice can be given to pregnant women about omega 3 fatty acid supplements?](#)  
[Other Food-related Safety Considerations: Flaxseed and flaxseed supplements](#)

## Nutrition Guideline

### Pregnancy

#### Choline

Choline is a nutrient involved in functions essential to fetal brain development and tissue expansion.<sup>(21)</sup> Choline availability during embryogenesis and perinatal development may be especially important.<sup>(59)</sup> Recent research is also exploring a potential relationship between low serum choline levels during pregnancy and neural tube defect risk.<sup>(60)</sup>

Choline needs in pregnancy are believed to be greater than choline requirements for non-pregnant females.<sup>(59)</sup> Pregnant women are recommended to obtain 450 mg per day of choline, an increase of 25 mg per day over the non-pregnant state to cover the amount needed for the fetus and placenta.<sup>(59)</sup> UL values for choline are set at 3.5 gram/day for pregnant women 19 years and older, and 3.0 grams per day for those 18 years and under who are pregnant. The UL refers to total choline intakes from food, fortified food and nutrient supplements.<sup>(59)</sup>

Choline is found in both plant and animal food sources, the greatest concentrations in eggs, beef and milk. An Alberta study with pregnant women found that women who reported regular egg and milk consumption were more likely to meet choline intake recommendations.<sup>(61)</sup> Choline may or may not be included in multivitamin supplements, including those marketed for pregnancy in Canada.<sup>(62)</sup>

**Table 9. Food Sources of Choline**

Food Sources of Choline	
<b>Protein Foods</b> Beef Chicken Cow's milk Eggs Kidney beans Navy Beans Pork Salmon	<b>Vegetables and Fruits</b> Broccoli Brussels sprouts Cauliflower Salad greens (such as endive, romaine lettuce) Spinach  <b>Grains</b> Wheat germ

Source: Health Canada. Canadian Nutrient File, Version 2015.<sup>(40)</sup>

All pregnant women are advised:

- To follow Canada's Food Guide; it describes a healthy eating pattern that includes dietary choline and will guide women in meeting their needs for other nutrients.
- To regularly consume foods rich in choline, such as: wheat germ, eggs, salmon, beef, chicken, navy or kidney beans and fluid cow's milk.

Consider recommending individual consultation with a Registered Dietitian if there is concern about choline intake from food choices.

See also: [When is referral to a Registered Dietitian recommended?](#)

#### Iodine

Iodine is a mineral that is an essential component of the thyroid hormones thyroxine (T4) and triiodothyronine (T3), which are involved in the regulation of various enzymes and metabolic processes, particularly protein synthesis<sup>(45)</sup> and required for proper skeletal and central nervous system development.<sup>(5)</sup> Iodine deficiency can lead to goiter, stunted physical and intellectual development, spontaneous abortion, and stillbirth.<sup>(63)</sup>

Iodine requirements during pregnancy increase from 150 mcg per day before conception to 220 mcg per day during pregnancy.<sup>(45)</sup> The UL for iodine is 1100 mcg per day.<sup>(45)</sup>



## Nutrition Guideline

### Pregnancy

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Although iodine deficiency is a major public health concern in many countries, including the United States, Australia and New Zealand,<sup>(21,37)</sup> Canada's mandatory iodization of salt in 1949 has resulted in adequate intake levels of iodine for most Canadians.<sup>(63)</sup> The most recent information for the Canadian population, based on 2009 to 2011 urinary iodine concentration, indicates iodine intake adequacy.<sup>(63)</sup> Food production and consumption patterns attributed to mild or moderate deficiencies in iodine intake include use of non-iodized salt, such as sea salt, reduction of salt in the diet and reduction of iodine supplementation in commercial dairy products.<sup>(63)</sup>

Examples of dietary sources of iodine include: iodized salt, seafood, eggs, milk and grain products. Analysis of dietary consumption data in the United States indicates that dairy product consumption was an important contributor to iodine status among pregnant, and non-pregnant women.<sup>(64)</sup> Currently available multivitamin supplements marketed for pregnancy in Canada contain iodine in sufficient amounts to meet the needs of a pregnant woman.<sup>(21)</sup>

All pregnant women are advised:

- To consume a varied diet as recommended by Canada's Food Guide, including fluid cow's milk and other dairy products such as yogurt and cheese.
- When choosing salt, choose an iodized salt.

#### Vegetarian Eating Patterns during Pregnancy

[Return to Key Questions](#)

#### Are there any extra considerations for vegetarian eating patterns?

Well-planned vegetarian eating patterns are appropriate for all stages of the life cycle, including pregnancy and lactation.<sup>(21,65)</sup> Vegetarian eating patterns support good nutritional status and health. However, ensuring nutritional adequacy becomes more challenging when foods are avoided and when nutrient needs are higher, such as during pregnancy.

Individuals may identify themselves as vegetarian, or primarily vegetarian, although they eat some fish or chicken, milk products, eggs or animal by-products. Lacto-ovo vegetarians avoid all animal flesh, but eat eggs (ovo) and dairy products (lacto). Vegans generally avoid all foods of animal origin.<sup>(65)</sup>

To optimize nutrition, health care providers are advised to:

- Identify the type of vegetarian diet followed (e.g. lacto-ovo, vegan).<sup>(65)</sup>
- Encourage women following a vegetarian eating pattern to plan their diet well, by including a variety of protein choices offered in Canada's Food Guide.
- Advise women who are following a vegan eating pattern to ensure their multivitamin supplement contains 2.6 mcg of vitamin B12 to meet the recommended dietary allowance (RDA) for pregnant women.<sup>(66)</sup>
- Refer women following a vegan eating pattern who are pregnant or planning a pregnancy to a Registered Dietitian for nutrition assessment and counselling.

#### Energy

The energy recommendations for pregnant women following a vegetarian eating pattern do not differ from those following a non-vegetarian eating pattern.<sup>(67)</sup>

## Nutrition Guideline

### Pregnancy

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#### Iron

Pregnant women following a vegetarian eating pattern are at higher risk for iron deficiency.<sup>(44)</sup> Screening, by measuring hemoglobin and serum ferritin by their primary health care provider, is recommended.<sup>(21)</sup> Well-chosen vegetarian diets can provide adequate iron; however, iron needs of vegetarians are 1.8 times higher than non-vegetarians due to the reduced bioavailability of vegetarian sources of iron.<sup>(21)</sup> Pregnant women following vegetarian diets are recommended to choose a multivitamin supplement with at least 27 mg of iron, an amount commonly found in prenatal branded supplements.<sup>(21,65)</sup> Additional iron supplements may be needed to prevent or treat iron deficiency anemia.<sup>(21,65)</sup>

#### Calcium and Vitamin D

Pregnant women following a vegan eating pattern face the greatest risk of inadequate calcium intake and are advised to include a wide variety of non-dairy sources of calcium in their diet.<sup>(65)</sup> Calcium requirements can be met by including 2 cups (500 mL) of fortified plant-based beverage and a variety of other calcium containing foods such as calcium-set tofu and leafy green vegetables.<sup>(21,65)</sup> The need for calcium supplementation can be assessed by a Registered Dietitian.<sup>(65)</sup>

Nutrition Services, Alberta Health Services recommends all pregnant women ensure their multivitamin supplement contains 400 IU of vitamin D. A higher dose supplement may be needed for those individuals at risk for vitamin D deficiency.<sup>(68)</sup>

#### Vitamin B12

Pregnant women following a vegan eating pattern are at high risk of inadequate intake of vitamin B12, a micronutrient which is only available from animal sources.<sup>(65,66)</sup> Those who exclude all animal products from their diet will require vitamin B12 from a combination of supplements, fortified food, or a reliable plant source modified to contain a bio-available source of vitamin B12 to meet the daily requirement of 2.6 mcg. Pregnant women following a vegan diet are recommended to choose a multivitamin supplement containing at least the daily requirement for vitamin B12 (2.6 mcg).<sup>(39)</sup> Examples of dietary sources of vitamin B12 appropriate for a vegan diet include fortified plant-based beverage and fortified meat analogues such as "veggie burgers".<sup>(66)</sup>

#### Zinc

In general, zinc status among individuals following a vegetarian eating pattern is adequate, although lower than the zinc status of non-vegetarians.<sup>(65)</sup> However, as with iron, high intake of phytates may interfere with absorption and are potentially detrimental to zinc status.<sup>(65)</sup> Pregnant women following a vegetarian eating pattern are advised to consume zinc-rich foods such as nuts, legumes, cheese, soy, whole grains, milk, and egg yolk often.

#### Omega-3 Fatty Acids

Pregnant women following a vegetarian eating pattern who avoid fish may not be consuming adequate DHA. Vegetarians can consume ALA from plant sources that is converted into DHA in the body; however, this process is inefficient. Vegetarians may have higher requirements for ALA, and are encouraged to consume foods rich in ALA such as walnuts, canola oil, soybean-based foods such as tofu and edamame.<sup>(65,69)</sup> In addition to ALA, pregnant women following a vegetarian eating pattern are advised to choose food sources of DHA that are appropriate for them, such as fortified foods, omega-3 eggs, and seaweed, or use a microalgae-derived DHA supplement.<sup>(65)</sup>

## Nutrition Guideline

### Pregnancy

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#### Other Nutrients of Concern

Choline and iodine may be low in the diets of individuals following a vegetarian eating pattern, particularly a vegan diet.<sup>(21,65)</sup> Encourage pregnant women to consume sources of choline and iodine that are appropriate for them, such as eggs, dairy products, and sea vegetables. Choosing iodized salt over sea salt or other non-iodized varieties will also contribute to iodine requirements.<sup>(65)</sup>

See also: [When is referral to a Registered Dietitian recommended?](#)

For related Nutrition Guidelines see: [Nutrition Guideline: Vegetarian Eating](#)

#### Nutrient Supplements during Pregnancy

[Return to Key Questions](#)

Consider recommending individual consultation with a Registered Dietitian if there is concern about supplement intakes during pregnancy. Women are advised to look for a Natural Product Number (NPN) when choosing a supplement.<sup>(35)</sup>

See also: [When is referral to a Registered Dietitian recommended?](#)

#### What are the recommendations for a multivitamin supplement for pregnancy?

A multivitamin is recommended to provide 0.4 mg (400 mcg) folic acid, 16 – 20 mg of iron, some vitamin B12, and 400 IU of vitamin D every day.<sup>(21)</sup> Initiation of folic acid supplementation is recommended at least 3 months prior to pregnancy to ensure adequate folic acid intake. Supplementation is recommended to continue throughout pregnancy and after birth, throughout the reproductive years.<sup>(36)</sup> Note, some commonly available multivitamin supplements (e.g. adult gummy multivitamins) may not contain adequate amounts of nutrients important for pregnancy, such as iron.

For women who have difficulty taking a multivitamin supplement, strategies that may help include:

- Taking the supplement in the evening.
- Working with their physician or pharmacist who can recommend alternatives (e.g. smaller pill size, different formulation such as PregVit).

#### What is the difference between a multivitamin and a “prenatal vitamin”?

“Prenatal vitamins” are multivitamin supplements marketed for pregnant women. Typically, they contain higher doses of folic acid and iron. Doses of 0.8 – 1 mg (800 – 1000 mcg) folic acid and 27 mg of iron are common. These amounts are considered safe to consume during pregnancy but not necessary for most women who are pregnant. Many common multivitamin brands contain adequate amounts of folic acid, iron, vitamin D, and vitamin B12 to meet the increased needs of pregnancy. Since the amounts of various vitamins and minerals included in multivitamin brands and “prenatal vitamins” vary across brand/type, women are encouraged to review supplement labels and discuss amounts with their healthcare provider.

## Nutrition Guideline

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#### Are there benefits of taking a multivitamin compared to single nutrient supplements?

Taking a multivitamin supplement containing iron and folic acid has been shown to reduce the number of LBW<sup>(70-72)</sup> and SGA infants<sup>(71-73)</sup> compared to taking single iron supplements with or without folic acid. A multivitamin supplement can support pregnant women, particularly those most vulnerable to poor nutrient intakes, in meeting the higher nutrient needs of pregnancy.<sup>(32)</sup> In addition to containing iron and folic acid, multivitamin supplements contain other nutrients that can be difficult to get enough of from food alone such as zinc, magnesium and vitamin B6.<sup>(32)</sup> Women vulnerable to poor nutrient intakes include those with social, economic, or geographic at-risk circumstances (e.g., those living in poverty),<sup>(21)</sup> as well as women experiencing substance dependency, household food insecurity, anemia, strict vegetarian (vegan) diet or poor eating habits.<sup>(51)</sup>

#### What if a pregnant woman requires higher amounts of iron or folic acid?

Most multivitamin supplements will not provide adequate doses of iron or folic acid for women identified as needing higher amounts. Additional single dose supplementation may be required for at-risk pregnant women.

See also: [Women who may require higher folic acid supplementation](#)  
[Women who may require higher doses of supplemental iron](#)

#### Other Nutrient Supplements

[Return to Key Questions](#)

#### Is the use of Lucky Iron Fish™ recommended to improve iron status in pregnant women?

Most women without iron deficiency can meet their additional iron needs in pregnancy through choosing a variety of iron rich foods from Canada's Food Guide and taking a multivitamin supplement containing 16 – 20 mg of iron. Lucky Iron Fish™ is not recommended as an alternative to supplements for the prevention or treatment of iron deficiency in the Canadian pregnant population.

There is insufficient evidence on the effectiveness of the Lucky Iron Fish™ in improving iron status.<sup>(74-76)</sup> The studies were only conducted in low income countries with a high prevalence of anemia, therefore, the limited research may lack applicability to the Canadian population. If a client chooses to use the Lucky Iron Fish™, advise them to use it according to manufacturer's directions.

#### What advice can be given to pregnant women about omega-3 fatty acid supplements?

Individuals are advised to consult a physician before taking an omega-3 fatty acid supplement. Supplements are not considered equivalent to eating fish.<sup>(54,77)</sup> Evidence suggests DHA and EPA supplements may increase gestation duration between one to three days in both low risk and high risk pregnant women.<sup>(55,78)</sup> EPA and DHA may increase birth weight by approximately 45 g and 100 g in low risk and high risk pregnancy, respectively.<sup>(55,79,80)</sup> No benefits on maternal preeclampsia, reducing risk of preterm delivery or other neonatal outcomes such as reduced risk of intrauterine growth restriction (IUGR) have been found.<sup>(55,78-82)</sup>

## Nutrition Guideline

### Pregnancy

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#### Fish Oil Supplements

Fish oil supplements vary in the levels of EPA and DHA they contain.<sup>(54)</sup> Doses of fish oil (EPA + DHA) of less than 3 grams per day can be safely used by most individuals.<sup>(83)</sup> However, fish *liver* oil supplements (e.g. cod liver oil) contain high levels of vitamin A. Therefore, fish liver oil supplements are not recommended for pregnant or breastfeeding women.<sup>(35,55)</sup> Fish oil supplements are contraindicated for women with intra-uterine bleeding and other bleeding disorders, or for women taking blood thinners.<sup>(55)</sup> Women are advised to look for a Natural Product Number (NPN) when choosing a supplement.<sup>(35)</sup> Those who dislike the “fishy” taste of fish oil supplements may be advised to store them in the freezer or look for an enteric coated supplement.

See also: [What is the concern with Vitamin A supplements in pregnancy?](#)

#### Algal Supplements

Supplements containing EPA and/or DHA made from algae are also available.<sup>(84)</sup> These would be suitable for vegetarians and individuals who are allergic to fish.

#### Flaxseed and Flaxseed Supplements

Theoretically, flaxseed may adversely affect pregnancy due to its mild estrogenic effects; however, there is insufficient reliable clinical evidence about the effects of flaxseed on pregnancy outcomes.<sup>(85)</sup> There is some evidence from observational studies that flaxseed oil is associated with an increased risk of preterm birth.<sup>(86)</sup> Because of the insufficient evidence regarding the safety of flaxseed in pregnancy and potential negative outcomes,<sup>(85,86)</sup> it may be safest for pregnant women to consume flaxseed in the amounts commonly found in foods<sup>(85)</sup> and to avoid flaxseed oil.<sup>(86)</sup>

#### Krill Oil Supplements

Krill oil is currently not recommended as safe during pregnancy. More evidence is needed on the safety and efficacy of krill oil supplements in order to recommend krill oil supplements in pregnancy.<sup>(87)</sup>

### Do women require a protein supplement during pregnancy?

Pregnant women do not require protein supplements. In the first half of pregnancy, protein requirements (about 46 g/day) for pregnant women are the same as for non-pregnant women.<sup>(67)</sup> Although pregnant women need an additional 25 g/day of protein in the second half of pregnancy (about 71 g/day), they can continue to meet their protein needs by following a healthy eating pattern and including a protein source at each meal and snack.<sup>(67)</sup> The consumption of high protein supplements in pregnancy is not required and may contribute to a diet unbalanced in protein and carbohydrate: the limited evidence demonstrates lack of beneficial effects and possible risks to the fetus.<sup>(88)</sup> Soy protein supplements or isoflavone supplements are not recommended during pregnancy as high intakes are mildly estrogenic and potentially could adversely affect fetal development.<sup>(21,89)</sup>

See also: [When is referral to a Registered Dietitian recommended?](#)

### What is the concern with Vitamin A supplements in pregnancy?

Multivitamin supplements marketed for pregnancy may contain either preformed vitamin A or beta-carotene, or both forms of vitamin A. Beta-carotene is not associated with any adverse effects during pregnancy.<sup>(45)</sup> Too much *preformed* vitamin A is associated with birth defects, particularly during the first trimester.<sup>(90)</sup> The UL for vitamin A for adult women is 3000 mcg per day (10,000 IU per day) and is based on *preformed* vitamin A (retinyl esters and retinol).<sup>(45)</sup>

## Nutrition Guideline

### Pregnancy

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Risk of exceeding the UL from a multivitamin supplement is minimal. Commonly used terms for *preformed vitamin A* in the ingredient list include retinyl acetate, retinyl succinate or retinyl palmitate. Pregnant women who are taking multiple supplements (e.g. multivitamin supplements, single supplements, fish liver oil supplements, nutrition supplement drinks) and foods high in preformed vitamin A, especially liver, may be at risk of exceeding the UL.

See also: [Other Food-Safety Related Considerations - Liver](#)

#### What about the use of other supplements during pregnancy?

Pregnant women are encouraged to inform their healthcare provider about the supplements they are taking and learn about the safety of their use during pregnancy. For example, advise women who are pregnant and considering taking probiotic supplements that limited evidence exists on the safety of their use during pregnancy and it is best to avoid probiotic supplement use.

See also: [Other Food-related Safety Considerations - Probiotic-containing Foods](#)

#### Beverage and Fluid Intake during Pregnancy

[Return to Key Questions](#)

#### How much fluid does a pregnant woman need?

Adequate hydration is essential as a woman accumulates 6 – 9 L of water during gestation.<sup>(5)</sup> Pregnant women are recommended to consume about 10 cups (approximately 2.5 L) of fluids per day for adequate hydration.<sup>(5)</sup> One cup is equivalent to 250 mL or 8 oz. This total amount of fluids includes all beverages, including drinking water.<sup>(5)</sup> Note that sugary drinks such as iced tea, fruit juice, sports drinks, specialty coffees and teas, flavoured waters with added sugars and fruit-flavoured drinks like fruit punch add little nutritional value. Water is recommended as the main source of fluids.

Pregnant women are advised:

- To drink water throughout the day.
- That healthy drink options other than water include milk and fortified plant-based beverages.
- To consume 10 cups (approximately 2.5 L) of fluids per day and possibly more if they are experiencing constipation.
- That if they are experiencing nausea and vomiting of pregnancy, additional actions may be needed to prevent dehydration.

Advise pregnant women experiencing signs of dehydration to contact their physician or Health Link at 8-1-1.

See also: [Constipation – what can be done during pregnancy?](#)

See also: [Nausea and vomiting – what can be done during pregnancy?](#)

## Nutrition Guideline

### Pregnancy

#### What is a plant-based beverage and are they a nutritious choice for pregnant women?

Common plant-based beverages include: soy, almond, rice, coconut, cashew, oat, hemp, flaxseed and other beverages derived from legumes, nuts, seeds, or grains. Plant-based beverages do not contain many of the vitamins and minerals that are naturally present in cow's milk such as vitamin B12, riboflavin, and zinc. Currently, there are no mandatory regulations that plant-based beverages must be fortified.<sup>(16)</sup> If fortified, these beverages are required to be fortified with vitamin A, vitamin D, vitamin B12, riboflavin, calcium and zinc.<sup>(16)</sup>

Since plant-based beverages (other than soy) are generally low in protein, women drinking a plant-based beverage as their main milk source are recommended to include a variety of lean meats, poultry, fish, beans and lentils, eggs, tofu and nuts to ensure adequate intake of protein.

Pregnant women are advised to:

- Choose a fortified, unsweetened soy beverage if cow's milk is not consumed.
- Choose a plant-based beverage that:
  - is labelled as fortified;
  - provides at least 6 g of protein per 250 mL (1 cup);
  - provides about 300 mg of calcium per 250 mL (1 cup).<sup>(16)</sup>

Individualized assessment and counselling by a Registered Dietitian may be considered.

See also: [What nutrients are important during pregnancy: Calcium and Vitamin D](#)  
[When is referral to a Registered Dietitian recommended?](#)

#### What is considered a safe intake of caffeine during pregnancy?

Health Canada's recommendation for safe intake of caffeine in pregnancy is to limit consumption to 300 mg or less per day.<sup>(91,92)</sup> Evidence suggests a dose-response association between maternal caffeine intake and an increased risk of adverse birth outcomes, including low birthweight,<sup>(93,94)</sup> spontaneous abortion, stillbirth, and small for gestational age.<sup>(94)</sup> However, evidence of causal effects of maternal caffeine intake on birth outcomes during preconception and pregnancy is lacking and inconclusive.<sup>(95)</sup>

**Table 10. Beverage and Food Sources of Caffeine**

Beverages with between 100 – 200 mg per cup (250 mL) serving	Beverages and foods with <100 mg per cup (250 mL) (or standard serving size)
Coffee, brewed Coffee, roasted and ground, filter drip Coffee, roasted and ground, percolated	Baking chocolate (unsweetened) (28 grams) Candy chocolate (milk, sweet) (28 grams) Chocolate milk Coffee, espresso (30 mL single shot) Coffee, instant Coffee, instant, decaffeinated Coffee, roasted and ground, decaffeinated Cola beverage, regular (355 mL can) Cola beverage, diet (355 mL can) Hot cocoa mix (prepared) Iced tea Tea, regular (average blend, leaf or bag)

Sources: Health Canada. Canadian Nutrient File, Version 2015; Health Canada, Caffeine in Food<sup>(40,91)</sup>

Note: caffeine content of coffee and tea can vary depending on the plant variety and growing conditions, brewing method and time, proportion of coffee or tea to water, roasting method, particle size ('grind') and serving size.

## Nutrition Guideline

### Pregnancy

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Advise pregnant women:

- To limit caffeine intake to 300 mg per day, from all sources.
- Common sources of caffeine for most women are:
  - Coffee – about 150 mg caffeine per 250 ml (1 cup).
  - Tea – green and black – about 30–50 mg of caffeine per 250 ml (1 cup).
  - Cola beverages – about 23–40 mg of caffeine per 250 ml (1 cup).
  - Chocolate – about 3–50 mg of caffeine in 1 chocolate bar.

See also: [What is the recommendation for caffeinated energy drinks during pregnancy?](#)

#### What is the recommendation for caffeinated energy drinks during pregnancy?

Pregnant women are advised to avoid all energy drinks during pregnancy. An energy drink is any beverage that contains some form of legal stimulant and/or vitamin added to provide a short-term boost in energy. These drinks may contain substantial and varying amounts of sugar and caffeine as well as other substances including taurine, carnitine, inositol, ginkgo, and milk thistle.<sup>(5)</sup> Many of these have not been studied for safety during pregnancy.<sup>(5,96)</sup> These drinks provide a caffeine content similar to or exceeding the amount of caffeine in the same volume of coffee: 75 mg – 85 mg in 1 cup (250 mL) and 142 mg – 160 mg in 1 can (473 mL).<sup>(97-100)</sup>

See also: [What is considered a safe intake of caffeine during pregnancy?](#)

#### Are sugary drinks recommended during pregnancy?

Sugary drinks include regular sodas, sports drinks, energy drinks, fruit juice, fruit drinks, fruit punch, fruit cocktails, flavoured waters with added sugars, iced tea and specialty coffee and teas.<sup>(5,101,102)</sup> These drinks are similar in that they contain a large amount of sugar and a low nutrient and high calorie content. An additional concern with sugary beverages is the possibility of their intake displacing nutrient dense choices. It is healthiest to limit or avoid these products.<sup>(101)</sup>

#### What herbal teas are considered safe to consume during pregnancy?

Evidence is limited around the safety of herbal teas in pregnancy. The following herbs are generally considered safe if limited to the amount commonly found in foods or consumed in moderation as an herbal tea.<sup>(103)</sup>

- Orange peel<sup>(103)</sup>
- Bitter orange<sup>(103)</sup>
- Ginger root<sup>(104,105)</sup>
- Peppermint leaf<sup>(106,107)</sup>
- Rose hip<sup>(108)</sup>

It is best to follow the preparation instructions on the label. General guidance is to limit intake of teas made from these herbs to no more than three cups daily during pregnancy, and to steep the tea for a short period of time (e.g. 3 – 5 minutes).

Other herbal teas may be safe to consume during pregnancy, however due to insufficient or conflicting messaging of their safety during pregnancy, they are not listed in this guideline as safe e.g. red raspberry leaf, fennel, chamomile, lemon balm, red bush (rooibos), valerian. Since many teas are often a mixture of herbs, it is best to check the ingredient labels to make sure all ingredients in the tea are safe.<sup>(103)</sup> Even “safe” herbs are not recommended in pregnancy if used in large or concentrated doses.<sup>(107,108)</sup>



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Advise pregnant women to check the ingredients of all other beverages including chai and herbal teas marketed for pregnancy. Chai tea is made by blending black tea with various spices, herbs and steamed milk. As chai tea products often contain multiple ingredients, the ingredients in the product need to be carefully examined before using to ensure that all the ingredients are safe for consumption during pregnancy.

Due to lack of evidence of safety in pregnancy, a wide variety of herbs, herbal teas, and herbal products are not considered safe. Additional information can be obtained from the Medications and Herbal Advice Line at: 1-800-332-1414.

#### Do women need nutrition supplement drinks during pregnancy?

Nutrition supplement drinks (e.g. Similac Mom™, Ensure™, Boost™) are not required for a healthy diet during pregnancy. They have no nutritional benefit over a healthy food snack (e.g. whole grain toast, peanut butter and milk) and are low in fibre.<sup>(40,109)</sup> There are many nutrients that aren't found in supplement drinks that can only be found in real food. Women are encouraged to eat a variety of foods from Canada's Food Guide daily.<sup>(110)</sup> Nutrition supplement drinks are not recommended as a multivitamin supplement replacement as they do not contain the right amount of nutrients included in recommended multivitamin supplements such as folic acid, vitamin D, and iron. If a woman is using these products on a regular basis, she may be at risk of both inadequate and/or excessive nutrient intakes.

Consider recommending individual consultation with a Registered Dietitian if there is concern about a woman's nutrient intake from food or supplement intakes during pregnancy.

See also: [When is referral to a Registered Dietitian recommended?](#)

#### Food Safety during Pregnancy

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#### Why is foodborne illness a concern during pregnancy?

Both a pregnant woman and her fetus are at higher risk for foodborne illness compared to non-pregnant women. Foodborne illness is caused by eating foods that have been contaminated by toxins or harmful organisms such as bacteria, parasites, and viruses.<sup>(111)</sup> During pregnancy, the higher production of progesterone can cause a women's immune system to become suppressed, making it more difficult to fight off infections.<sup>(112)</sup> Some bacteria can pass through the placenta and this can be problematic for the unborn baby.<sup>(111,113)</sup> The consequences of foodborne illness during pregnancy can result in miscarriage, stillbirth or baby born premature or ill.<sup>(111,112)</sup>

#### What is the best way to reduce the risk of foodborne illness during pregnancy?

Safe food handling is the best way to reduce the risk of foodborne illness. Women can reduce their risk of foodborne illness by properly cooking, cleaning, chilling, storing and separating foods.<sup>(114)</sup>

Advise pregnant women to follow basic food safety practices:<sup>(111)</sup>

- Wash hands (with warm, soapy water for at least 20 seconds):
  - Before handling any food.
  - After handling food such as raw meat, poultry and fish.
  - After handling animals or pets.

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- Wash all raw fruit and vegetables thoroughly. Wash food with drinkable water.
- Keep raw foods and cooked foods separate.
- Wash and disinfect (with diluted household bleach) food preparation surfaces and utensils that have been in contact with raw meat, poultry, fish and seafood.
- Use refrigerated raw meat, poultry, fish and seafood by the “best before” date, or no more than 2 – 4 days after buying it.
- Make sure hot foods are hot (above 60°C/140°F), cold foods are cold (below 4°C/39°F), and that all meats are well-cooked. Cook eggs until the yolk is firm.
- Cook meats, poultry, fish and seafood to their safe internal temperature (refer to the [Safe Internal Cooking Temperatures Chart](#)).
- Cool cooked foods quickly. Bacteria can grow if left out for more than 1 hour during summer outdoor activities or 2 hours at room temperature.
- Reheat any cooked food to at least 74°C/165°F.<sup>(102)</sup> Reheat leftovers only once.<sup>(102)</sup>
- Eat refrigerated leftovers as soon as possible (within 2 – 4 days).

See also: [What resources are available for the public?](#)

#### What foods are women advised to avoid during pregnancy and are there safer alternatives?

Women who are planning to become pregnant and those who are pregnant are advised to avoid many raw and undercooked foods. Table 11 provides a summary of foods to avoid and safer alternatives for pregnant women:<sup>(111)</sup>

**Table 11. Foods to Avoid and Safe Food Alternatives for Pregnant Women**

Foods to avoid	Safer alternatives
<ul style="list-style-type: none"> <li>• Raw and undercooked: fish (e.g. sushi), shellfish (e.g. raw oysters), meats (e.g. steak tartare), and poultry.</li> </ul>	<ul style="list-style-type: none"> <li>• Oysters, clams, mussels that are cooked until shell has opened.</li> <li>• Sushi that does not contain raw fish.</li> <li>• Meat and poultry that are cooked to a safe internal temperature.               <ul style="list-style-type: none"> <li>○ Beef or pork (including ground) 71°C (160°F)</li> <li>○ Wild game (deer, elk, small game) 74°C (165°F)</li> <li>○ Poultry 74°C (165°F)</li> <li>○ Fish 70°C (158°F)</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Ready-to-eat meat and poultry such as hot dogs and deli-meats (e.g. bologna, roast beef and turkey breast).</li> </ul>	<ul style="list-style-type: none"> <li>• Dried and salted deli meats (e.g. salami and pepperoni).</li> <li>• Hot dogs and deli meats can be eaten if heated until steaming hot.               <ul style="list-style-type: none"> <li>○ Heat deli meats and hot dogs to at least 74°C (165 °F)</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Refrigerated pates, meat spreads, and smoked seafood and fish.</li> </ul>	<ul style="list-style-type: none"> <li>• When these products are sold in a can</li> <li>• When they are heated to a safe internal temperature.               <ul style="list-style-type: none"> <li>○ Heat refrigerated meat spreads, smoked fish or shellfish until at least 74°C (165 °F).</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Foods that contain raw or undercooked eggs such as homemade Caesar vinaigrette, cookie dough, cake batter and homemade eggnog.</li> </ul>	<ul style="list-style-type: none"> <li>• Cook eggs until the yolk is firm.</li> <li>• Egg dishes that are well cooked to a safe internal temperature of 74 °C (165 °F).</li> <li>• Pasteurized eggnog</li> <li>• Use pasteurized egg products when making uncooked food that calls for raw eggs.</li> </ul>

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Foods to avoid	Safer alternatives
<ul style="list-style-type: none"> <li>Foods that contain raw or undercooked flour (e.g. raw dough or batter or any other product containing raw non-baked flour).<sup>(115)</sup></li> </ul>	<ul style="list-style-type: none"> <li>Cooked flour</li> </ul>
<ul style="list-style-type: none"> <li>Raw or unpasteurized milk and dairy products (e.g. yogurt made from unpasteurized milk).</li> </ul>	<ul style="list-style-type: none"> <li>Pasteurized milk</li> <li>Pasteurized dairy products that are cooked, in a casserole or au gratin.</li> </ul>
<ul style="list-style-type: none"> <li>Unpasteurized AND pasteurized soft, semi-soft and blue-veined cheeses such as Havarti, Brie, Camembert, and Mexican-style cheeses (e.g. queso fresco, queso blanco).</li> </ul>	<ul style="list-style-type: none"> <li>For additional information on cheese safety during pregnancy see: <a href="#">What are the food safety concerns with cheese and what are safe cheese choices?</a></li> </ul>
<ul style="list-style-type: none"> <li>Unpasteurized fruit juice and cider.</li> </ul>	<ul style="list-style-type: none"> <li>Pasteurized fruit juice and cider.</li> </ul>
<ul style="list-style-type: none"> <li>Raw and cooked sprouts (e.g. alfalfa, clover, radish and mung bean sprouts). Usual cooking methods don't consistently cook sprouts thoroughly to make them safe for consumption.</li> </ul>	

Source: Health Canada, 2016 Aug 09 <sup>(111) (a)</sup>

#### Is it safe for pregnant women to consume fish?

Most fish can be safely consumed in pregnancy. Fish is a widely consumed, highly nutritious source of protein, vitamin D and omega-3 fatty acids.<sup>(35)</sup> Health Canada recommends that pregnant women eat at least 150 grams (5 ounces) of cooked fish every week.<sup>(116)</sup>

Along with the potential benefits of fish consumption, there are risks of exposure to harmful contaminants. A form of mercury known as methylmercury (MeHg) is a toxin present in the environment and in trace amounts in all foods,<sup>(52)</sup> with fish being the primary source for humans.<sup>(117)</sup> Infants who have had very high MeHg exposure in the womb may experience neurodevelopment abnormalities.<sup>(118)</sup> At chronic lower exposure levels, other neurodevelopment deficits, such as deficits in memory, motor, attention and verbal skills, may also occur.<sup>(118)</sup>

Pregnant women are advised:

- To consume a variety of fish and shellfish that are low in MeHg and high in omega-3 fatty acids. Fish that are low in MeHg include anchovy, capelin, hake, herring, Atlantic mackerel, pollock (Boston bluefish), salmon (farmed and wild), smelt, rainbow trout, shrimp, clam, mussel and oyster.<sup>(117)</sup>
- To choose canned "light" tuna instead of canned "white" or albacore tuna as "light" tuna contains less MeHg.<sup>(52,117)</sup>
- To avoid fish that are high in MeHg. High MeHg fish include fresh or frozen tuna, shark, swordfish, escolar, marlin, and orange roughy.<sup>(117)</sup>
- That regular consumption of fish imported from Asia may result in an increased risk of mercury poisoning, particularly dried fish.<sup>(119)</sup>
- To avoid raw fish and shellfish to reduce the risk of bacterial illness.<sup>(5,111)</sup>

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Fish consumption advisories for fish caught in Alberta lakes and rivers can be accessed at <http://aephin.alberta.ca/> or by calling Health Link at 811.

A free mobile app for fish consumption developed by the Government of Alberta is available on Apple and Google Play platforms. <sup>(120)</sup> The app is called Should I Eat This Fish?

See also: [What advice can be given to pregnant women about omega 3 fatty acid supplements?](#)

#### What are the food safety concerns with cheese and what are safe cheese choices?

Soft, semi-soft, and blue-veined cheeses have a higher risk of *Listeria monocytogenes* (*L. monocytogenes*) contamination, which can result in listeriosis. The highest incidence of listeriosis is amongst the vulnerable population including pregnant women.<sup>(121)</sup> Symptoms of listeriosis are typically mild in pregnant women, but the passage of the organism through the placenta can cause miscarriage, stillbirth, perinatal septicaemia, and meningitis in the newborn baby.<sup>(121)</sup> Due to the risk it carries to the unborn child, pregnant women are advised to follow cheese safety recommendations.

Soft, semi-soft and blue-veined cheeses contain higher levels of moisture than hard or firm cheeses. Higher moisture content can aid in the growth of *L. monocytogenes*. In addition, soft, semi-soft and blue-veined cheeses can also support growth of the bacteria *L. monocytogenes* if contaminated after pasteurization (e.g. during packaging, while storing at home).<sup>(122)</sup>

Safe cheese choices during pregnancy include:<sup>(111,123)</sup>

- Hard cheeses (e.g. Parmesan, Romano), firm cheeses (e.g. Cheddar, Swiss, and Colby) processed cheese slices and spreads, cream cheese and cottage cheese when made from pasteurized milk.
- Well-cooked soft, semi-soft and blue-veined cheeses made from pasteurized milk.

Clarification on cheese safety messaging:

- AHS recommendations to the public are to choose pasteurized milk products. AHS recommendations are more cautious recommendations.
  - Health Canada resources list unpasteurized hard cheeses as a safe alternative, due to their low moisture content.<sup>(111)</sup>
  - Health Canada resources list cheese dishes (e.g. casserole or au gratin) that contain unpasteurized and/or pasteurized soft, semi-soft and blue-veined cheeses as safe for pregnant women to consume if cooked to an internal temperature of 74°C (165°F).<sup>(111,124)</sup>
- Popular cheeses such as mozzarella, feta, Monterey Jack, and Paneer can vary in risk. Advise women to consume only when cooked well.<sup>(121,123,125)</sup>

#### Other food-related safety considerations

##### Arsenic

Arsenic is a natural occurring element found in our environment. It can enter groundwater through soil or erosion, and compounds of arsenic can be used for the manufacturing of products that can enter our environment.<sup>(126,127)</sup> Arsenic may be found at very low levels in many foods including meat and poultry, milk and dairy products, bakery goods and cereals, vegetables, fruits and fruit juices, and fish and shellfish.<sup>(126)</sup> The inorganic form of arsenic is of concern as it may contribute to potential adverse health effects including increase risk of cancer.<sup>(126,127)</sup> Rice and some types of seaweed can contain higher amounts of inorganic arsenic compared to other foods.<sup>(126)</sup>

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Some evidence has shown a positive relationship between in utero arsenic exposure and acute respiratory tract infections among infants when high levels of arsenic were present in drinking water.<sup>(128)</sup> There are limitations in the research studies investigating associations between arsenic and adverse outcomes.<sup>(128,129)</sup> As well, there is uncertainty about short and long-term health risks associated with low dose, chronic arsenic exposure.<sup>(130)</sup>

More research is needed to determine if there is an association between levels of arsenic exposure during pregnancy and adverse outcomes in infants and children. The Canadian Food Inspection Agency (CFIA) continues to monitor arsenic in foods and the potential human health risks associated with arsenic exposure.<sup>(126)</sup> Pregnant women are advised to follow a balanced diet that contains a variety of grains and whole grains (e.g. barley, oats, rice and wheat).<sup>(130)</sup>

#### Flaxseed and Flaxseed Supplements

There is insufficient evidence regarding the safety of flaxseed in pregnancy.<sup>(85,86)</sup> Current recommendations are for pregnant women to restrict their consumption of flaxseed to the amounts commonly found in foods.<sup>(85)</sup> Pregnant women are also advised to avoid flaxseed oil.<sup>(86)</sup>

See also: [Is it safe for pregnant women to take omega-3 fatty acid supplements?](#)

#### Honey

Both pasteurized and unpasteurized honey are considered safe for consumption by pregnant women.<sup>(131)</sup> Questions about the safety of honey arise because it can be contaminated with the spores of the bacteria *Clostridium botulinum*, which can grow in the digestive tract and produce harmful toxins, leading to botulism.<sup>(131-134)</sup> In healthy adults, including pregnant women, the digestive tract is able to protect against the botulism infection.<sup>(131,135,136)</sup> Botulism in adults is very rare.<sup>(131,135,136)</sup> The purpose of pasteurization of honey is to prolong the shelf-life, rather than to reduce *C. botulinum* spores.<sup>(137)</sup> Honey has a very low moisture content and high acidity, which makes contamination of honey with other harmful bacteria unlikely.<sup>(132)</sup> Note that honey is not recommended for children under one year of age due to risk of botulism.<sup>(138)</sup>

#### Liver

Pregnant women who are consuming foods high in preformed vitamin A, especially liver, may be at risk of exceeding the UL for vitamin A, depending on preformed vitamin A intake from other food and supplement sources. Pregnant women are recommended to limit their consumption of beef liver, particularly during the first trimester of pregnancy, to less than 75 grams (2½ ounces) every two weeks.<sup>(21,90)</sup> Public resources are more cautious in their recommendations, with HPHC suggesting pregnant women limit liver consumption to no more than 75 g (2½ ounces) every two weeks, with no specification of trimester of pregnancy.<sup>(139)</sup> This recommendation is below the tolerable upper limit level (UL) for vitamin A and considered safe for pregnant women when taking a multivitamin supplement containing vitamin A.<sup>(90)</sup>

Individual assessment and counseling by a Registered Dietitian can support women in adapting food and nutrient recommendations to their unique situations.

See also: [What is the Concern with Vitamin A Supplements in Pregnancy?](#)

See also: [When is referral to a Registered Dietitian recommended?](#)

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### Probiotic-containing Foods

Probiotics consumed in moderation from common foods with a long history of consumption such as yogurt and kefir are generally considered safe.<sup>(19)</sup> The probiotic genera used in these foods are usually *Lactobacillus* and *Bifidobacterium*.<sup>(140)</sup> Advise pregnant women to check with their health care provider prior to consuming other popular food products. A specific example of a probiotic food product that has health and safety risks,<sup>(141,142)</sup> may have adverse effects in immunocompromised individuals<sup>(141)</sup> and is not recommended during pregnancy is kombucha tea of any form.<sup>(143)</sup>

Few probiotic strains have been tested for their safety during pregnancy.<sup>(144)</sup> Adverse effects have been reported for the probiotic *Saccharomyces*.<sup>(144)</sup> Advise women who are pregnant and considering taking probiotic supplements that limited evidence exists on the safety of their use during pregnancy and it is best to avoid probiotic supplement use.

### Soy-containing Foods

The amount of soy commonly found in foods or beverages is unlikely to be a concern during pregnancy.<sup>(21,89)</sup> Soy protein supplements or isoflavone supplements are not recommended during pregnancy as high intakes are mildly estrogenic and potentially could adversely affect fetal development.<sup>(21,89)</sup>

### Sugar Substitutes

Moderation is encouraged when consuming or recommending products sweetened with sugar substitutes.<sup>(145)</sup> Sugar substitutes include artificial sweeteners and intense sweeteners obtained from natural sources.<sup>(146)</sup> They may be bought as table top sweeteners or present in beverages (such as pop or fruit flavoured beverages), “diet” products, yogurt, breakfast cereals, canned fruit packed in water, baked goods, desserts, spreads, salad dressings and chewing gums.

Moderate use of sugar substitutes during pregnancy is considered safe.<sup>(145)</sup> It is recommended that pregnant women avoid excessive consumption of products containing sugar substitutes as such foods could replace nutrient dense, energy-yielding foods.<sup>(145)</sup>

**Table 12. Sugar Substitutes and Common Brands Considered Safe in Moderate Amounts<sup>(147)</sup>**

Sugar Substitutes	Common Brand Names
Acesulfame Potassium	Ace-K or Sunett®
Aspartame	Nutrasweet®, Equal®, private label brand
Saccharin	Hermesetas®
Stevia	Krisda®, Truvia®, stevia, Pure Via™
Sucralose	(Splenda®)

Note: Advise pregnant women to read the ingredient label as name brands and store brands can have multiple products with different sugar substitutes. For example, the Sugar Twin® brand products may use cyclamate, sucralose or stevia sugar substitutes.

### Cyclamates:

- Caution<sup>(148)</sup> or avoidance is recommended for the use of cyclamates (Sucaryl®, Sugar Twin®, Sweet N'Low®, Weight Watchers Table-Top Sweetener®) during pregnancy due to unknown risks associated with consumption above the Acceptable Daily Intake (ADI) of 11 mg/kg body weight. Women who are using cyclamates are advised to limit their intake to below the ADI. As an example, a woman needs to limit her intake to 2 packages of Sugar Twin containing cyclamate per day to remain within this recommendation.<sup>(148)</sup>

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Stevia leaves:

- Stevia leaves (fresh, dried or powdered) and crude extracts of stevia leaves are available in Canada for use in personal cooking.<sup>(146)</sup> The safety of this product for consumption during pregnancy is not known.<sup>(149)</sup>

Other:

- Other sugar substitutes permitted for use in Canada<sup>(147)</sup> and considered safe for consumption at or below the acceptable daily intake (ADI) for the specific sugar substitute include: advantame, D-tagatose, neotame, and thaumatin.<sup>(150)</sup>
- Sugar alcohols permitted for use as food additives in Canada include: hydrogenated starch hydrolysates, isomalt, lactitol, maltitol, maltitol syrup, mannitol, sorbitol, sorbitol syrup, xylitol, and erythritol. Health Canada advises that the consumption of approved sugar alcohols do not pose a health risk during pregnancy.<sup>(150,151)</sup>

### Common Discomforts of Pregnancy Considerations

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#### Nausea and vomiting – what can be done during pregnancy?

Nausea and vomiting of pregnancy (NVP) is the most common medical condition of pregnancy, affecting 50% to 80% of all pregnant women.<sup>(152)</sup> In most cases NVP subsides by the 16<sup>th</sup> week of pregnancy, however, up to 20% of women continue to have symptoms throughout their pregnancy.<sup>(153)</sup> It is recommended that other causes of nausea and vomiting (gastrointestinal, genitourinary, central nervous system and toxic/metabolic problems) be ruled out when assessing pregnant women.<sup>(21)</sup>

Hyperemesis gravidarum (HG) is a severe form of NVP that affects approximately 0.3% to 2% of pregnancies.<sup>(152)</sup> HG has been defined as persistent and excessive vomiting starting before the end of the 22<sup>nd</sup> week of pregnancy and may be diagnosed as mild or severe.<sup>(152)</sup> Severe HG may include metabolic disturbances such as carbohydrate depletion, dehydration and electrolyte imbalance.<sup>(152)</sup> Large ketonuria and a significant weight loss of at least 5% from pre-pregnancy weight are often included as criteria for diagnosis of HG.<sup>(21)</sup> Treatment for HG may require hospitalization and interventions such as intravenous fluid replacement therapy, total parenteral nutrition and anti-nausea medication.

Women with NVP or HG can experience substantial physical and emotional impacts to their daily functioning, affecting their well-being and quality of life. Supportive counselling from any health care professional is recommended to help women deal more positively with the effects.<sup>(152)</sup>

Supplementation with a multivitamin containing 16 – 20 mg iron may not be tolerated for some women experiencing NVP. If a multivitamin supplement with iron is not tolerated and iron stores are sufficient, a multivitamin supplement with lower iron or without iron may be taken until NVP subsides. If any multivitamin supplement is not tolerated single vitamin supplements of folic acid 0.4 mg (400 mcg) and vitamin D (400 IU) may be taken until NVP subsides.<sup>(152,153)</sup>

Advise women experiencing NVP to eat pregnancy-safe foods that are appealing and tolerable to them while aiming for a healthy diet. Anecdotal evidence suggests dietary strategies that may reduce symptoms of nausea and vomiting include:

- Eat small frequent meals every 1 – 2 hours to avoid a full stomach.
- Separate solids and liquids to avoid the stomach from becoming too full. For example, eat a small portion of food, wait 20 – 30 minutes, then take some liquids.
- Choose dry, bland, salty and/or high protein foods for snacks and meals.

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- Eat foods and beverages at room temperature and avoid those that are hot or cold (depending on personal preference).
- Choose lower fat, higher protein foods.
- Eat before getting out of bed and when nausea is less severe.
- Eat before, or as soon as feeling hungry to avoid an empty stomach that may aggravate nausea.
- Do not swallow excessive saliva (spit out the saliva and rinse mouth frequently).
- Avoid offensive odours or sensory stimuli.
- Try colder fluids, including ice chips and popsicles.

Pregnant women with nausea are encouraged to drink fluids as tolerated, particularly fluids with electrolytes if dehydration is a concern.<sup>(154)</sup> When liquids cannot be tolerated without vomiting and a woman has not responded to outpatient management, a physician may recommend hospitalization for evaluation and treatment. Fatigue may exacerbate NVP; women can be encouraged to lie down as needed and increase rest.<sup>(152)</sup> Advise women experiencing NVP to discuss the condition with their physician, especially when medical or alternative therapies for NVP are being considered.

#### Constipation – what can be done during pregnancy?

Constipation occurs among 11% - 38% of women during pregnancy.<sup>(5,155)</sup> It may occur as a side effect of high doses of supplemental iron and/or as part of the digestive changes associated with pregnancy.<sup>(5)</sup> Constipation is often caused by increased levels of progesterone and a decrease in gut transit time in the second and third trimester.<sup>(155)</sup>

There is limited evidence to support the effectiveness of interventions to manage constipation during pregnancy.<sup>(5)</sup> Anecdotal evidence suggests strategies that may reduce symptoms of constipation include:

- Drink 10 cups (approximately 2.5 L) fluids every day.<sup>(5)</sup> One cup is equivalent to 250 mL or 8 oz. This total amount of fluids includes all types of non-alcoholic beverages such as milk and plant-based beverages and fluids found in soups. Water is recommended to be the main source of fluids.<sup>(5)</sup>
- Increase fibre intake by eating high fibre foods including legumes such as beans, split peas and lentils, whole grain breads, 100% bran cereals and vegetables and fruit.<sup>(5)</sup>
- Regular physical activity including safe activities during pregnancy such as walking and swimming.<sup>(5)</sup>

Additional support from a Registered Dietitian is recommended for women with severe ongoing constipation issues for dietary intervention. Advise pregnant women to discuss the use of fibre supplements and laxatives with a physician prior to use.

See also: [When is referral to a Registered Dietitian recommended?](#)  
[What advice can be given to women about physical activity during pregnancy?](#)

#### Heartburn – what can be done during pregnancy?

Approximately 17% - 45% of pregnant women experience acid reflux or heartburn.<sup>(5)</sup> Heartburn is a sensation of burning in the upper part of the digestive tract including the throat. It is caused by pregnancy hormones affecting the muscle that keeps food in the stomach and letting acid in the stomach come back up the throat.<sup>(156)</sup> Heartburn is a concern if it discourages pregnant women from eating. Relief from heartburn may be achieved through dietary and lifestyle changes. However there has been no evidence-based recommendation for the treatment of heartburn in pregnancy.<sup>(156)</sup>



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Anecdotal evidence of strategies that may reduce symptoms of heartburn include:

- Avoiding foods and drinks that make symptoms worse.<sup>(156,157)</sup>
- Eating small, more frequent meals.<sup>(5,156-158)</sup>
- Eating slowly and chewing food well.<sup>(158)</sup>
- Drinking fluids between meals, not with meals.<sup>(158)</sup>
- Avoiding carbonated drinks and beverages containing caffeine.<sup>(5,158)</sup>
- Avoiding lying down right after eating.<sup>(5,157,158)</sup>
- Raising head and shoulders when lying down.<sup>(5,156-158)</sup>
- Avoiding fried or greasy foods.<sup>(5,158)</sup>

Women with resistant symptoms are recommended to seek advice from their physicians about the use of over the counter and prescription medications to relieve symptoms.

#### Health Condition Considerations in Pregnancy

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#### Are there special nutritional considerations regarding diabetes in pregnancy?

Nutrition counselling by a Registered Dietitian is a recommended component of care for women at risk for or diagnosed with diabetes in pregnancy, including women with pre-existing type 1 diabetes, type 2 diabetes or those diagnosed with gestational diabetes mellitus (glucose intolerance with onset or first recognition during pregnancy).<sup>(159)</sup> Women with pre-existing diabetes (type 1 or type 2) who are of reproductive age are advised to seek preconception care from an interdisciplinary team.<sup>(159)</sup> Recommended counselling components include the importance of glycemic control prior to pregnancy, the impact of BMI on pregnancy outcomes, and the need for a multivitamin supplement containing 1 mg (1000 mcg) of folic acid every day, starting at least 3 months prior to pregnancy.<sup>(159)</sup>

Women at high risk for gestational diabetes mellitus can be referred for nutrition counselling on healthy eating and prevention of excessive gestational weight gain in early pregnancy, ideally before 15 weeks of gestation, to reduce the risk of developing gestational diabetes mellitus. Risk factors for gestational diabetes mellitus include:<sup>(159)</sup>

- Age  $\geq 35$
- BMI  $\geq 30$  kg/m<sup>2</sup>
- Member of high risk population (Indigenous, Hispanic, South Asian, Asian, African, Arab)
- Parent or sibling with type 2 diabetes
- Corticosteroid use
- Prediabetes
- Previous GDM diagnosis
- Previous delivery of a macrosomic infant (large for gestational age)
- Polycystic ovarian syndrome or acanthosis nigricans (darkened patched of skin)

Screening for gestational diabetes mellitus at 24 – 28 weeks gestation is recommended for all pregnant women, while screening at any stage of pregnancy is recommended for women with a high risk of gestational diabetes mellitus.<sup>(159)</sup> Individualized nutrition care from a Registered Dietitian for women at risk for or diagnosed with diabetes in pregnancy can promote adequate nutritional intake, achievement of target glucose levels, appropriate maternal weight gain and growth of the fetus.<sup>(159)</sup>

See also: [When is referral to a Registered Dietitian recommended?](#)

For related Nutrition Guidelines see: [Nutrition Guideline: Diabetes in Pregnancy](#)

## Nutrition Guideline

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#### Are there nutrition considerations for hypertensive disorders of pregnancy?

Hypertensive disorders of pregnancy are the leading cause of adverse maternal and perinatal outcomes.<sup>(21)</sup> Hypertensive disorders of pregnancy include: pre-existing hypertension, gestational hypertension and pre-eclampsia or eclampsia.<sup>(6)</sup> Risks of uncontrolled pre-eclampsia include preterm delivery, intrauterine growth restriction and maternal morbidity and mortality.<sup>(5)</sup>

It is advised that pregnant women with pre-existing or chronic hypertension manage their blood pressure through monitoring sodium intake and following a balanced diet.<sup>(160)</sup> Pregnant women who have chronic hypertension combined with inadequate calcium intakes during pregnancy may require a calcium supplement in doses of 1000 – 2500 mg per day to reduce their risk of preeclampsia.<sup>(17)</sup> Referral to a Registered Dietitian is recommended to assess adequate calcium intake and need for supplementation among pregnant women with chronic hypertension.

Different dietary interventions for the prevention of gestational hypertension have been suggested. These include: dietary salt restriction, calcium supplementation, vitamin D supplementation (alone or combined with calcium supplementation), multivitamin supplement with folic acid, and vitamin C and/or E supplementation.<sup>(17)</sup> However, there is insufficient evidence at this time to make recommendations for specific dietary intervention or strategies.<sup>(17,18)</sup> A healthy pre-pregnancy body weight is associated with a decreased risk of gestational hypertension. Note however, that pregnant women are advised to follow the weight gain recommendations for their pre-pregnancy BMI. Weight loss or caloric restriction at any time during pregnancy is not recommended.<sup>(17)</sup>

In order to manage hypertensive disorders during pregnancy, pregnant women are advised:

- To follow recommendations for adequate weight-gain during pregnancy.
- To monitor sodium intake and follow a balanced diet following Canada's Food Guide.
- To take a multivitamin supplement that meets recommendations of iron, folic acid, and vitamin D every day.
- To meet calcium requirements with calcium-rich foods or to talk with a Registered Dietitian to assess the need for single mineral supplementation.

See also: [When is referral to a Registered Dietitian recommended?](#)  
[How much weight gain is appropriate during pregnancy?](#)  
[Nutrients: Calcium and Vitamin D](#)

#### Are there recommended foods to avoid to eat during pregnancy to prevent infant allergies?

There is insufficient evidence to recommend maternal avoidance of any single nutrient or any single food to prevent allergy from developing in the infant.<sup>(161)</sup> No restriction or avoidance of particular foods in the maternal diet<sup>(162)</sup> or addition of foods or supplements<sup>(163)</sup> are proven to prevent allergy in the infant at this time. This is an area of current research.<sup>(162,163)</sup>

Pregnant women are advised to follow a varied diet based on Canada's Food Guide. Maternal dietary exclusion of nutritious foods can put a mother and her fetus at risk of nutritional inadequacy. It is necessary for a pregnant woman to avoid the foods to which she has a diagnosed allergy. There is evidence that reducing the number of times a woman suffers from allergy reactions while she is pregnant can help reduce infant morbidity and mortality.<sup>(164,165)</sup>

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Refer pregnant women with multiple food allergies, or who restrict foods (protein foods, grains, fruits and vegetables) due to pre-existing allergies, to a Registered Dietitian for nutrition counselling.

See also: [When is referral to a Registered Dietitian recommended?](#)

#### Adolescent Pregnancy

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Adolescent pregnancies are considered high-risk.<sup>(166,167)</sup> Pregnant adolescents are at increased risk of anemia, preterm birth, intrauterine growth restriction (IUGR), low birth weight (LBW), congenital anomalies, neonatal intensive care unit (NICU) admissions, and neonatal death.<sup>(166)</sup> Evidence suggests that medical risks are most severe for adolescents under 15 years.<sup>(167)</sup>

#### What are the nutrient of concern for adolescent pregnancy?

The growing adolescent has distinct nutritional needs compared to adults, such that their nutrient requirements are higher than at any other point in life.<sup>(168)</sup> Limited evidence suggests that nutrient intakes in pregnant adolescents that fall most frequently below the DRI are energy, iron, folate, calcium, vitamin E, and magnesium.<sup>(167)</sup> Dietary survey findings from the 2004 Canadian Community Health Survey indicate that adolescent girls have inadequate intakes of nutrients of concern in pregnancy including folate, vitamin B12, calcium, iron, and fibre.<sup>(169)</sup> Pregnant adolescents' calcium needs are higher than those of pregnant adults.<sup>(44)</sup> Pregnant adolescents need a total of 1300 mg of calcium and 600 International Units of vitamin D daily to meet their requirements.<sup>(44)</sup>

Energy needs are influenced by many factors, including: growth status, pregravid weight, physical activity, stage of pregnancy, and body composition. Pregnant adolescents are at increased risk of anemia, and monitoring by their health care provider for diagnosis and treatment is recommended.<sup>(39,166)</sup>

**Table 13. Recommended Daily Amounts of Nutrients for Pregnant Adolescents from All Sources (food, multivitamin supplement, single source supplement)**

Nutrient	Adolescent Pregnancy (under 19 years)	Upper Limit (UL)
Calcium	1300 mg <sup>a</sup>	Total daily intake not to exceed 3000 mg <sup>a</sup>
Choline	450 mg <sup>a</sup>	Total daily intake not to exceed 3.0 g <sup>a</sup>
Fibre	28 g <sup>a</sup>	Safe upper limit not defined <sup>a</sup>
Folate/Folic Acid	0.6 mg (600 mcg) <sup>a</sup>	0.8 mg (800 mcg) <sup>a</sup> The UL for folate applies only to synthetic forms obtained from supplements, fortified foods, or a combination of the two <sup>a</sup>
Iodine	0.22 mg (220 mcg) <sup>a</sup>	Total daily intake not to exceed 1.1 mg (1100 mcg) <sup>a</sup>
Iron	27 mg <sup>a</sup>	Total daily intake not to exceed 45 mg <sup>a,b</sup> unless advised by a physician. Monitor iron status closely.
Omega-3 Fatty Acids (DHA and EPA)	Include at least 150 grams (5 ounces) of cooked fish rich in omega 3 fatty acids and low in mercury each week during pregnancy <sup>c</sup>	Safe upper limit not defined <sup>c</sup>
Vitamin A	750 mcg <sup>a</sup> (2500 IU)	2800 mcg <sup>a</sup> (9333 IU) UL is for preformed vitamin A only <sup>a</sup>
Vitamin B12	2.6 mcg <sup>a</sup>	Safe upper limit not defined <sup>a</sup>
Vitamin D	600 IU <sup>a</sup>	Total daily intake not to exceed 4000 IU <sup>a</sup>

Sources:<sup>a</sup> Health Canada, 2010. Dietary Reference Intake Tables<sup>(33,44)</sup>. <sup>b</sup> IOM 2006<sup>(44)</sup>. <sup>c</sup> Health Canada, 2009. Prenatal Nutrition Guidelines for Health Professionals: Fish and Omega-3 Fatty Acids<sup>(35)</sup>

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Referral to a Registered Dietitian for nutrition assessment and counselling is recommended, as this may result in improvements in mean birth weights, reduced low birth weight, and reduced preterm birth.<sup>(166,170)</sup> Referral to a Canada Prenatal Nutrition Program, where projects are available in their community, is also recommended.

See also: [When is referral to a Registered Dietitian recommended?](#)

#### What are the recommendations for gestational weight gain in adolescents?

Adolescents are at increased risk of preterm delivery and having LBW (low birth weight) and SGA (small gestational age) infants. The 2009 IOM report concluded there is insufficient evidence to support a modification of the gestational weight gain guidelines for pregnant adolescents less than two years post-menarche.<sup>(30)</sup> The IOM and the AND recommend that pregnant adolescents gain weight within the ranges for adult women for their pre-pregnancy BMI category.<sup>(30,51)</sup> Very young pregnant adolescents (under 16 years of age) are at higher risk of delivering a small infant compared to older women, despite similar weight gain, and are advised to strive for weight gains at the upper end of the recommended range for their pre-pregnancy BMI category.<sup>(30)</sup>

Nutrition assessment and counselling regarding weight gain in pregnancy is recommended for all adolescents.<sup>(166)</sup>

See also: [When is referral to a Registered Dietitian recommended?](#)  
[How much weight gain is appropriate during pregnancy?](#)

For related Nutrition Guidelines see: [Nutrition Guideline: Children and Adolescents](#)

#### Substance Use during Pregnancy

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#### Is it safe for pregnant women to consume alcohol?

Advise women to avoid alcohol during pregnancy.<sup>(5,171,172)</sup> Alcohol consumption in pregnancy can cause fetal harm.<sup>(171-173)</sup> Alcohol is a teratogen that can cross the placenta and pass from mother to fetus. It is well established that exposure to alcohol at high-risk levels can have physical and neurodevelopmental effects on the infant.<sup>(171)</sup>

Evidence of fetal safety or harm at low levels of alcohol consumption is inconsistent; therefore, a safe level of alcohol consumption cannot be established.<sup>(5,171,173)</sup> Amount, timing and frequency of alcohol intake alongside factors such as fetal genetic susceptibility and maternal health status impact Fetal Alcohol Spectrum Disorder (FASD) risk.<sup>(174)</sup> Alcohol abstinence during pregnancy prevents FASD and the resulting birth defects and developmental disabilities.<sup>(174)</sup> Health care providers are advised to create a safe environment for women to report alcohol consumption and to offer motivational counselling strategies aimed at helping women reduce or eliminate alcohol use.<sup>(171)</sup>

#### Is it safe for pregnant women to consume cannabis?

Evidence exists about the side effects of cannabis or cannabis-derived products (e.g. cannabis edibles) used during pregnancy.<sup>(175)</sup> Cannabis use has been linked to birth defects, premature delivery, and low birth weight.<sup>(176)</sup> Pregnant women are advised to avoid the use of these products throughout pregnancy and lactation.<sup>(175,176)</sup>

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### Physical Activity during Pregnancy

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#### What needs to be considered when discussing physical activity during pregnancy?

There are many benefits to being physically active throughout pregnancy for both mother and baby. Physical activity during pregnancy has been shown to have benefits such as prevention of excessive gestational weight gain, gestational diabetes, and hypertensive disorders, as well as impacting appropriate birth weight, timing of delivery, and child body composition.<sup>(177-179)</sup> Contraindications to physical activity may include, but are not limited to: previous preterm birth or spontaneous abortion, intrauterine growth restriction, anemia, malnutrition or eating disorder, and other medical conditions such as uncontrolled type 1 diabetes, pregnancy-induced hypertension and cardiovascular, respiratory or systemic disorders.<sup>(179)</sup>

The key recommendations of the *2019 Canadian Guideline for Physical Activity throughout Pregnancy* are:<sup>(179)</sup>

- Physical activity reduces the risk of common pregnancy complications.
- Women are recommended to accumulate at least 150 minutes of moderate intensity physical activity each week. There are many ways to achieve this including activities such as walking, that have no added expenses.
- Previously inactive women can safely start physical activity and gradually progress toward the recommended amount.
- When participating in physical activity women should be cautious of activities where falling or direct physical contact may result in harm to themselves or their fetus.

Pregnant women are advised:

- To be physically active throughout pregnancy unless they have contraindications to being physically active and/or have been told not to be active by a health professional.
- To consult with their physician, obstetrician, or other prenatal provider (nurse practitioner or midwife) regarding advice about physical activity.
- That a physical activity professional (such as a Kinesiologist, Certified Exercise Physiologist, or an Exercise Therapist) can provide advice on being physically active throughout pregnancy.

The Canadian Guidelines for Physical Activity throughout Pregnancy provide detailed information on safety, contraindications, recommendations and resources. See: <https://csepguidelines.ca/guidelines-for-pregnancy>.

### Other Special Considerations

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#### Are there special considerations when working with pregnant women with culturally diverse backgrounds (e.g. Indigenous peoples, immigrants, and refugees)?

Pregnancy may be a time for many women that provokes culturally based responses and reactions from themselves, family and others. Health care providers are encouraged to approach each client interaction as unique, avoiding stereotyping women's possible cultural influences in pregnancy based on past experiences or knowledge of cultural food practices.

Health care providers are advised to continually assess and improve their own cultural competence. While no health care provider can be an expert in all aspects of diversity, cultural competence involves continual learning that arises from experiences, encounters, and ongoing reflection. <sup>(2)</sup>

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Referral to a Registered Dietitian

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### When is referral to a Registered Dietitian (RD) recommended?

A nutrition assessment by a Registered Dietitian will help determine if a pregnant woman has adequate calorie and nutrient intakes. In addition to calorie and macronutrient intake, specific micronutrients to be assessed include calcium, vitamin D, omega-3 fatty acids, folic acid, and iron.

Referrals for individual nutrition assessment and counselling by a Registered Dietitian are especially important for pregnant women who:

- Are adolescents (less than 15 years old or less than 3 years since onset of menses).
- Are pregnant with twins, triplets or higher order multiples.
- Previously had a low birth weight infant.
- Have a low pre-pregnancy weight – defined as <90% of desirable body weight or body mass index (BMI) <18.5.
- Have a poor weight gain in the 2nd/3rd trimester – defined as <0.25 kg (0.5 lbs) per week (for women with a pre-pregnancy BMI of 18.5 – 24.9) and <0.5 kg (1 lb) per week for multiple gestation and women with a pre-pregnancy BMI below 18.5.
- Have a nutrition-related health condition they are managing in conjunction to their pregnancy, such as gestational diabetes, pre-eclampsia, or other medical conditions with an impact on nutrition (e.g. inflammatory bowel disease, bariatric surgery, celiac disease).

Other reasons that could indicate a Registered Dietitian referral:

- Severe nausea and vomiting of pregnancy.
- Higher requirements for specific nutrients (e.g. additional folic acid needs above those recommended for most pregnancies).
- Weight gain during pregnancy that exceeds the recommended range based on pre-pregnancy BMI
- Risk for poor nutrient intakes due to other factors including: alcohol and substance use, poverty and low socioeconomic status.
- Food allergies or food intolerances that cause severe food restrictions.
- Other restricted patterns of eating such as following a restricted vegetarian or vegan pattern of eating.

Referral processes will vary based on zone and site policy. Referral information, and referral forms can be found at [www.albertareferraldirectory.ca](http://www.albertareferraldirectory.ca).

Resources

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### What resources are available for professionals?

#### Prenatal Nutrition Tool (PreNut):

The *PreNut* helps prenatal programs or care providers identify nutrition issues to discuss with clients during their pregnancy *and* offer client-centred conversations about key nutrition issues. The tool is meant to be used by the care provider in discussion with a client.

<https://www.albertahealthservices.ca/info/Page8248.aspx>

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- *PreNut questionnaire* - consists of 13 questions and covers 4 topic areas: Pregnancy Weight Gain, Multivitamins, Life Circumstances and Overall Food Intake.
- *PreNuT Conversation Guide* - provides information to support conversations with clients on key nutrition topics identified while using the tool.
- A twelve minute *Training Video* that describes purpose and suggested use of the *PreNuT Questionnaire and Conversation Guide*

#### Nutrition Guidelines and Supporting Resources:

Nutrition guidelines for health professionals on a variety of healthy eating and active living topics including general nutrition and nutrient information can be found on the Nutrition Guidelines page.

<https://www.albertahealthservices.ca/info/Page8247.aspx>

Nutrition guidelines for health professionals on Pregnancy: Multiples.

<https://www.albertahealthservices.ca/info/Page8248.aspx>

Additional information for safety of teas and herbal supplements during pregnancy.

<https://www.albertahealthservices.ca/topics/Page11975.aspx>

Health Canada prenatal nutrition guidelines.

<https://www.canada.ca/en/health-canada/services/publications/food-nutrition/prenatal-nutrition-guidelines-health-professionals-background-canada-food-guide-2009.html>

Resources to support healthy gestational weight gain:

<https://www.albertahealthservices.ca/info/Page14356.aspx>

- Healthy pregnancy weight gain charts for singletons
- Body mass index (BMI) calculator wheel
- Healthy pregnancy weight gain poster

An accredited continuing medical education learning program on healthy pregnancy weight gain. Registration is free. All health care providers are welcome to register.

<http://ecme.ucalgary.ca/programs/hpwg/>

#### Community Programs for At-Risk Pregnant Women:

The Canada Prenatal Nutrition Program (CPNP) is a community-based program that provides support to improve the health and well-being of pregnant women, new mothers and babies facing challenging life circumstances. For more information about CPNP Projects in Alberta visit: <https://www.capccpnalberta.com>

### What resources are available for the public?

#### Preconception Health:

For information on preconception health, for both men and women. [www.ReadyOrNotAlberta.ca](http://www.ReadyOrNotAlberta.ca)

#### Pregnancy and Birth:

General pregnancy nutrition information for the public can be found in Healthy Parents, Healthy Children. <http://www.healthyparentshealthychildren.ca/>

Health Canada also has a website devoted to pregnancy information.

[www.canada.ca/en/health-canada/services/healthy-living/healthy-pregnancy.html](http://www.canada.ca/en/health-canada/services/healthy-living/healthy-pregnancy.html)

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### General Nutrition Handouts:

For nutrition resources visit Nutrition Education Materials at:

<https://www.albertahealthservices.ca/nutrition/Page11115.aspx>

General handouts on key nutrients include:

- Iron and Your Health.  
<https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-iron-and-your-health.pdf>
- Vitamins and Minerals: From Pills or Food?  
<https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-vitamins-and-minerals.pdf>

### Food Safety Handouts:

Health Canada – Food Safety for Pregnant Women webpage.

Available online at <https://www.canada.ca/en/health-canada/services/food-safety-vulnerable-populations/food-safety-pregnant-women.html>

(Note: the sprout information does not align with AHS recommendations)

Health Canada – Safe Food Handling for Pregnant Women resource. Available online at:

<https://www.canada.ca/content/dam/canada/health-canada/migration/healthy-canadians/alt/pdf/eating-nutrition/healthy-eating-saine-alimentation/safety-salubrite/vulnerable-populations/pregnant-enceintes-eng.pdf>

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