# Shake it Up, Baby? Maybe Not. Considering Nutritional Shakes in Pregnancy

"I just found out I'm pregnant. Can I keep drinking my energy shake in the mornings?"
"My doctor gave me the go-ahead to work out. Okay to have a protein shake after the gym?"
"My immunity-boosting drink is a life-saver. Can I keep using it while I'm pregnant?"

These are common questions during pregnancy, and ones that we hear a lot at MotherToBaby. Perhaps you've wondered the same thing yourself. As teratogen information specialists, we provide facts about how a woman's exposure in pregnancy might affect her developing baby. So, when we get questions about shakes, powders and other nutritional supplements in pregnancy, we look to the research. And that research, or lack of it, leads us to caution women against drinking that favorite nutritional shake while they're pregnant. Here's why:

**Lack of FDA approval**
Nutritional shakes and powders fall under the category of "supplements." Supplements aren't approved by the U.S. Food and Drug Administration (FDA) in the way that food and medicines are. The FDA does set out safety requirements for supplements, but the manufacturers are responsible for ensuring that their own products meet those requirements (kind of like a home builder inspecting their own house.) This means that shake makers and other manufacturers can put their products on the market without proving their safety, or even showing that the products actually do what they claim they will. Once a supplement is on the market, the FDA relies mostly on consumers' reports to alert them of side effects or other problems that could lead to warnings or recalls.

This is not to say that all supplement makers are unscrupulous or careless. Many manufacturers go above and beyond the FDA requirements for safety, and stand behind the purity and efficacy of their products. But the lack of oversight has allowed supplements to wind up on shelves despite being contaminated with bacteria, pesticides or heavy metals (such as lead), or having mislabeled ingredients or amounts of those ingredients. These inconsistencies can be dangerous, especially for people who take medications that might interact with unknown ingredients, or for pregnant women who need to avoid potentially harmful additives that can affect the baby.

**Lack of studies in pregnancy**
Nutritional shakes often contain vitamins, herbs, plant derivatives and other goodies intended to boost energy, strengthen immunity or have other positive health effects. But these additives are often listed on the label as "herbal blends" or "proprietary blends," meaning that the individual ingredients are not revealed. And even if they are listed individually, some of those ingredients may have been studied in pregnancy, while others have not. The lack of studies means we don't know if they might have harmful effects on a developing baby or otherwise increase risks in pregnancy.

For example, some ingredients may be "generally recognized as safe (GRAS)" when eaten in the amounts usually found in food, but they could increase the risk of miscarriage when used at high concentrations in pregnancy. The concentration of a plant-derived ingredient can vary from batch to batch, depending on the growing and harvesting conditions of the plant. So in the end, you can't be sure what you and your developing baby are getting with that shake.

**Nutritional needs in pregnancy**
A varied, healthy diet along with a daily prenatal vitamin recommended by your healthcare provider should give you all the vitamins, minerals and other nutrients that you and your growing baby need during pregnancy. Adding the extra vitamins found in that shake to your diet might result in exceeding the daily recommended amounts for pregnancy. On the flip side, if you are using a nutritional shake as a meal substitute, you might be missing essential nutrients that you and your baby should be getting from food. Always talk to your healthcare provider about the best way to meet your specific nutritional needs during pregnancy.

So, what to do about that container of protein powder sitting in your pantry or those bottles of energy shake taking up space in the fridge? Our advice? Find a new home for them until after you've delivered and are no longer breastfeeding. After all, you want to give your pregnancy a "fair shake," right?

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Maya has been a healthy, happy vegan since she was a teenager. Now, at age 25 and pregnant for the first time, she is suddenly worried and uncertain about whether she can provide all the nutrients her developing baby needs if she continues to follow her vegan diet during pregnancy. She contacted us at MotherToBaby looking for answers. Maya's question is not unusual, but since it's a bit outside our area of expertise, I enlisted the help of an expert in maternal nutrition to help answer it.

Registered dietitian Kerry Jones, MPH, RDN, LDN is the owner of Milestones Pediatric & Maternal Nutrition in Cary, North Carolina. She works with women who are trying to conceive, pregnant, or breastfeeding, as well as children, which makes her a perfect resource for this topic. Kerry was happy to weigh in on Maya's concerns and other common questions we get at MotherToBaby about vegetarian and vegan diets in pregnancy and breastfeeding.

First, what exactly does vegetarian mean? And how is vegan different from vegetarian? By definition, vegetarian

means eating everything except meat, poultry, or seafood. Some vegetarians also choose to exclude eggs but consume dairy products (lacto-vegetarian), or exclude dairy but eat eggs (ovo-vegetarian). A vegan diet takes it a step further by avoiding all ingredients that come from animals, including eggs, dairy, gelatin, and honey. While these diets may seem limiting to someone who doesn't follow them, vegetarians and vegans still enjoy an abundant variety of foods. Now, on to Maya's question…

## Q: Can I have a healthy pregnancy if I'm vegetarian or vegan?

**Kerry Jones:** Yes, you can definitely have a healthy pregnancy, even if you follow a vegetarian or vegan diet. However, that does not mean that eating during your pregnancy will be without its challenges, since there are many nutrients that are crucial to your child's development that can be hard to obtain from a plant-based eating pattern, such as vitamin B12, choline, vitamin K2, DHA, iodine, iron, and zinc, to name a few. However, with proper planning, supplementation, and support, I believe that women who are vegetarian or vegan can have healthy pregnancies.

## Q: Are there any vitamins I'll need to take during pregnancy in addition to my regular prenatal vitamin?

**Kerry:** As I mentioned, there are several nutrients that are crucial to fetal development that are hard to obtain in a vegetarian or vegan diet. It will be important to make sure that your prenatal vitamin is high quality and contains not only enough of these nutrients, but also the best forms of these vitamins and minerals to ensure they will be well absorbed by your body (such as Methylcobalamin and/or adensylcobalamin when looking for vitamin B12). It is also important to ensure the prenatal vitamin you choose does not contain unwanted additives or nutrients (such as having both calcium and iron in the same supplement, since we know these minerals compete for absorption) and is third-party tested (since there is currently no governing organization that oversees the safety, content, purity, dosage, or effectiveness of supplements). In addition to a high-quality prenatal vitamin, it will likely be beneficial to take an algae-based DHA supplement. However, it is important to talk to your OB/GYN before starting any supplements.

## Q: How can I be sure I'm getting enough protein during pregnancy if I don't eat animal products?

**Kerry:** That's a great question. We know that getting enough protein during pregnancy is important for both mothers and developing babies. Luckily, there are a variety of plant-based protein sources, such as: seitan, tempeh, beans, seeds, nuts, and lentils, to name a few. I recommend that all adults, including women who are pregnant, aim to have one-fourth of their plate or bowl be composed of protein sources at each meal and have a protein source at each snack. Following this meal pattern typically allows most pregnant women to meet their protein needs. However, if you are concerned about your specific protein needs during early and late pregnancy, contact a prenatal registered dietitian, such as myself, to get customized recommendations.

The biggest concern related to meeting protein needs for pregnant women following plant-based diets is ensuring they are getting the individual amino acids they need. Animal proteins are often referred to as complete proteins, which means the protein source contains all of the essential amino acids (or protein building blocks) that our body needs. However, not all plant protein sources are complete proteins. Therefore, it is important that pregnant women following plant-based diets not only get enough protein throughout the day, but also eat a variety of protein sources to make

sure they are getting all of the needed amino acids.

## Q: I love my OB, but she doesn't have experience with vegetarian and vegan diets in pregnancy. Any advice?

**Kerry:** If you are getting push back or hesitation from your OB/GYN to support your dietary decision, it is important to remember that your OB/GYN is likely concerned that you and your baby are not going to get the nutrients that you both need during this critical period. Make sure to be an advocate for your health and beliefs to explain why you want to be a vegetarian and vegan while pregnant. Additionally, consider working with a prenatal registered dietitian to get evidenced-based, individualized recommendations on how to meet you and your baby's nutrient needs. This will help give you the support you need to meet your unique needs and give your OB/GYN the reassurance they need to feel confident in your dietary decisions.

## Q: My baby is almost due. Is there anything I need to know about being vegetarian/vegan while breastfeeding?

**Kerry:** Yes! Just like when you were pregnant, what you eat when breastfeeding matters. This is because when you are breastfeeding exclusively you are still the single source of nutrition for your little one just like you were during pregnancy. While the levels of some nutrients in breastmilk are not affected by maternal diet, the amount of many vitamins and minerals in breastmilk is dependent on how much you consume as a mom, such as vitamin B12, vitamin K2, choline, DHA, and iodine, to name a few. Therefore, it is important to continue your prenatal vitamin or switch to a postnatal vitamin and have a plan to get the nutrients that your baby needs while breastfeeding and you need for postpartum recovery.

After hearing Kerry's feedback, Maya was relieved to know that by incorporating a few changes to her diet she could indeed have a healthy plant-powered pregnancy! If you have questions about your diet in pregnancy or breastfeeding, talk to your healthcare provider or a registered dietitian with expertise in maternal nutrition. And as always, MotherToBaby is here for you for any questions about exposures during pregnancy and breastfeeding.

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It was late on a Tuesday when a chat came in from Dr. Rodriguez. “My patient is taking a medication for epilepsy. She is planning a pregnancy and I’ve seen from some sources she may need to take more folic acid to help prevent birth defects. Does she need to be on a higher dose?” As teratogen information specialists, we receive many inquiries regarding folic acid; and it was understandable why this healthcare provider was confused as the guidance isn’t exactly straightforward.

### *What is folic acid?*

Folic acid is the lab made form of folate. Folate is a B9 vitamin. Folate and folic acid help the body create new cells and can lower the chance of having a child with a class of birth defects called neural tube defects, which are problems with the brain and spinal cord. The neural tube forms very early in pregnancy (around 4 to 6 weeks after the first day of the last menstrual period), so it’s important that any woman who could become pregnant get enough folic acid at least one month ***BEFORE*** she gets pregnant. In the United States many of our foods, such as breakfast cereal, bread, pasta, and rice are fortified with folic acid, which meant the vitamin has been added to the food. According to the Centers for Disease Control and Prevention (CDC), folic acid fortification programs have led to a 35% decrease in the rate of neural tube defects! We also get folate, which is the naturally occurring form of Vitamin B9, from foods like dark leafy greens, beans, citrus fruits, and nuts. However, only about 50% of this form is bioavailable (able to be absorbed and used by the body) so additional intake, in the form of a supplement, is recommended by organizations like the CDC and National Institutes of Health (NIH).

## How much is needed?

The CDC recommends that all women of reproductive age get at least 400 mcg (0.4 mg) of folic acid each day. Once pregnant, organizations like The NIH and the United States Preventative Services Task Force (USPSTF) recommend that women who are pregnant get 600 to 800 mcg (0.6 to 0.8 mg) of folic acid per day. This amount can usually be met by taking an over-the-counter prenatal vitamin; a higher amount is not recommended for most pregnant women.

Women who have previously had a pregnancy affected by a neural tube defect (NTD) should take a higher dose of folic acid if they are planning to become pregnant again. The CDC and the American College of Obstetricians and Gynecologists (ACOG) recommends 4,000 mcg (4 mg) per day for these individuals. This higher dose should be started at least one month before becoming pregnant and should be continued through the first three months of pregnancy.

So what about Dr. Rodriguez's patient who was on an anti-epileptic drug (AED) for her seizure disorder? Many, but not all, medications in the AED class are known as "folic acid antagonists." This means that they can interfere with how the body absorbs and uses this important vitamin. If someone becomes pregnant while taking a folic acid antagonist, they may have lower levels of folic acid in their body and their pregnancy could be at higher risk of neural tube defects. That said, there is no great research that shows that taking extra folic acid would lower the risk of NTDs for women taking folic acid antagonists. So, should a woman taking an AED stick with the 400 mcg per day that is already recommended for everyone, or take more just in case it could be helpful?

Let's look at the current professional recommendations:

- The American Academy of Neurology and the American Epilepsy Society guidelines state that all women of childbearing age, with or without epilepsy, should be supplemented with at least 400 mcg (0.4 mg) of folic acid per day prior to conception and during pregnancy. They go on to say there is not enough data to know if taking folic acid at doses higher than 400 mcg offer greater protective benefits for women on AEDs.

- The American College of Obstetricians and Gynecologists (ACOG) recommends 4000 mcg (4 mg) of folic acid per day for individuals at increased risk of having a baby with a NTD, which includes women with seizure disorders.

- The Centers for Disease Control and Prevention (CDC) only recommends a higher dose of folic acid for those with a history of a pregnancy affected by a NTD.

- The U.S. Department of Health and Human Services (Office of Women's Health) recommends talking to your doctor to determine the right dose of folic acid if you are taking a medication for epilepsy.

Clear as mud, right? The current consensus seems to be that there is no consensus. Some groups recommend a higher dose while others do not. In situations like this where there is no clear consensus from the professional groups, it comes down to weighing the risks vs. benefits. The risks include the fact that higher doses of folic acid are not well studied in pregnancy, could mask a B-12 deficiency, and may actually make some medications less effective. The benefits of taking more are theoretical (not proven). A higher dose of folic acid ***might*** be protective in preventing birth defects while on a folic acid antagonist, but there is not enough research to know if this is true. Ultimately, much more data will be needed to come up with clear guidelines for women with epilepsy.

Because Dr. Rodriguez's patient was on carbamazepine, a folic acid antagonist that is associated with a higher chance for neural tube defects, she decided that she would have a thorough discussion of the risk vs. benefits of taking a higher dose of folic acid with her patient before she became pregnant. Dr. Rodriguez was glad she hadn't missed any overarching recommendations for women who need to take medication to control their seizure disorders during pregnancy. She ended her chat by saying: "It can be a challenge to keep up to date with all the recommendations. I'm so glad to have access to MotherToBaby to be able to ask questions like this."

MotherToBaby specialists are always happy to review the latest data and professional recommendations with healthcare providers and patients alike. If you have questions about folic acid, epilepsy medication, or any other exposures in pregnancy or lactation, please feel free to get in touch.





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If you are researching prenatal vitamins, we are guessing that you might be considering a pregnancy, or you just found out that you are pregnant. How exciting! We're also guessing that you have some questions. Pregnancy does that to a woman: it makes us start questioning the safety of everything that we used to take for granted. At MotherToBaby, we answer many types of questions about exposures during pregnancy and breastfeeding. But hands down, **the most common question I'm asked about involves *prenatal vitamins*.**

Many women ask me what brand of prenatal vitamins they should take or if the brand they are currently using is the right choice. With so many different prenatal vitamins available over-the-counter and by prescription, this is a very good question. We applaud you for doing your research. You are going to be a great Mom.

## *Prenatal Vitamin Tips*

Before delving too much further, some basic tips. The **1st tip:** We recommend that you discuss your prenatal vitamin options with your healthcare provider, since she or he will know you and your health care needs the best. As mentioned, this will review prenatal vitamins for healthy women. Some women may have medical concerns that require a different nutrient intake.

The **2nd tip** that I always mention is that it may be easier ***and cheaper*** (depending on your healthcare insurance plan) to simply ask for a prescription for prenatal vitamins from your healthcare provider.

**3rd tip**: Do not buy a prenatal vitamin that contains herbal ingredients. Herbal products have not been well studied for use during pregnancy and breastfeeding. They are not regulated by the U.S. Food and Drug Administration (FDA) and there are no standard recommended amounts to take. In addition, purity of herbals found in over-the-counter products can be of concern. For more information on why herbals should be avoided, please see our MotherToBaby fact sheet on Herbal Products.

**Prenatal vitamins are made up of vitamins and minerals.** A healthy diet is the best way to get the vitamins and minerals that your body needs. But even if we eat a healthy diet, we might fall short on some nutrients during pregnancy. Prenatal vitamins help fill in the gaps and increased needs for vitamins and minerals during a pregnancy.

There are **Dietary Reference Intakes (DRI)** to help people know how much of each vitamin or mineral they should aim to get each day.

Some vitamins and minerals also have a recommended **Tolerable Upper Intake Level** (**UL**). The UL is designed to help us know the maximum recommended daily intake for a typical healthy person.

DRIs and ULs are there to help guide us in getting enough of a good thing but also to keep us from getting too much of a good thing.

As mentioned, vitamins should not be the only source of our nutrients. Therefore, your vitamin does not need to contain 100% of the DRI. Remember to take into account all sources of the vitamin or mineral when adding up your daily intake. This means including food sources as well as any other supplements you might take. DRI values can change by age, gender, and pregnancy and breastfeeding status. If you have a medical condition, talk to your healthcare providers/dieticians for your specific dietary needs.

Research on taking vitamins and mineral supplements at levels that are higher than the DRI and UL during pregnancy are limited. Because of the lack of information about taking high levels of vitamins and minerals in a pregnancy, it is generally recommended that pregnant women do not exceed the DRI unless your healthcare provider has prescribed it for the medical management of a specific deficiency or medical condition.

Now, we come to the main question: **What are the basic vitamins / minerals generally suggested for prenatal vitamins for healthy women, and how much of each vitamin and mineral do women need for pregnancy?**

## Vitamins and Minerals

For pregnant women 19 years old and older, the first 5 vitamins/minerals listed below are the basic supplements from which healthy pregnant women might benefit. The DRI and UL for pregnancy are listed. Not all items have an UL.

- **Iron**: DRI: 27 mg. UL: 45 mg.
- **Calcium:** DRI: 1,000mg. UL: 2,500mg.Supplements should have at least 250 mg, but all women should be getting at least 1,000 mg per day of elemental calcium.
- **Folic Acid (Folate)**: DRI: 600 mcg (0.6 mg) to 800 mcg (0.8 mg).At least 400 mcg (0.4 mg) should be in your prenatal vitamin.
- All women who could become pregnant should be getting enough folic acid / folate, even if they are not currently planning on a pregnancy.
- **Iodine:** DRI: 220 mcg to 290 mcg. UL: 1,100 mcg.At least 150 mcg should be in your prenatal vitamin.
- **Vitamin D (calciferol):** DRI: at least 15 mcg (600 IU). UL 100 mcg (4,000 IU).

In addition to the above suggested supplements for prenatal vitamins, pregnant women should make sure they are getting enough of the vitamins / minerals listed below. If they cannot manage this with diet, then a supplement might help.

- **Vitamin A**: DRI 770 mcg. UL 3,000 mcg.
  - Vitamin A is found in two primary forms: plant-based carotenes (**beta-carotene**) and animal-based retinoids (**retinol**, retinal, retinoic acid, retinyl palmitate, and retinyl acetate).
  - Look for vitamin A that is from beta-carotene. Beta-carotene is less likely to build up toxic levels in the body than with retinoids. In addition, high levels of retinoids (**retinol**, retinal, retinoic acid, retinyl palmitate, and retinyl acetate) have been linked to an increased chance for birth defects.
- **B Vitamins**
  - There are eight B vitamins:

- Vitamin $B_1$ / thiamine: DRI: 1.4 mg
- Vitamin $B_2$ / riboflavin: DRI: 1.4 mg
- Vitamin $B_3$ / niacin: DRI: 18 mg
- Vitamin $B_5$ / pantothenic acid: 6 mg
- Vitamin $B_6$ / pyridoxine: DRI 1.9 mg
- Vitamin $B_7$ / biotin: DRI: 30 mcg
- Vitamin B9 / folic acid (already mentioned above)
- Vitamin $B_{12}$ / cobalamin: DRI: 2.6 mcg

- These are a group of water-soluble vitamins, which means that your body will not store them. Therefore, it

would be unlikely to reach a toxic level in the body. If you and your healthcare provider feel that you are unable to meet your DRI of the B vitamins through diet, then you should look for a prenatal vitamin that includes them. All prenatal vitamins should include at least folic acid (Vitamin $B_9$), which I mentioned earlier as an essential vitamin for pregnancy.

- **DHA/ Omega-3 Fatty Acids:** There is no clearly defined DRI, but in 2000 it was suggested that pregnant women should aim for 300 mg/day. The best way to get these is to include fish in your diet. MotherToBaby has a blog on eating fish in pregnancy. The FDA also has a guide on which fish are the best options to eat in pregnancy by breaking the fish into categories of Best Choices, Good Choices, and Choices to Avoid. The guide can be found here. However, if you do not get enough in your diet, your healthcare provider might suggest including a supplement for DHA during your pregnancy.
- **Vitamin E**: DRI: 15 mg. UL: 1,000 mg.
- **Vitamin C**: DRI: 85 mg. UL: 2,000 mg
- **Zinc**: DRI. 11 mg. UL: 40 mg.

It is recommended to start taking prenatal vitamins before you try to become pregnant; at a minimum, take folic acid daily. If you are already pregnant, start as soon as you learn about your pregnancy.

Again, if you have a medical condition (including but not limited to diabetes, celiac disease, eating disorders, substance misuse, malabsorption, irritable bowel, inflammable bowel, or history of bariatric surgery), talk with your healthcare providers about your specific nutritional needs.

Now that you are an expert in reading your prenatal vitamin label, you can tackle (with the advice of your health provider) selecting the one that is best for you. MotherToBaby is always available to answer questions about all exposures during pregnancy and breastfeeding. Pregnancy will bring wonder-filled moments for you and your family. MotherToBaby is here to help you and your healthcare providers to make it as stress-free as possible with up-to-date information on medications and more.

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