Vitamin A

This sheet is about exposure to vitamin A in pregnancy and while breastfeeding. This information is based on published research studies. It should not take the place of medical care and advice from your healthcare provider.

What is vitamin A?

Vitamin A is an essential vitamin. Essential vitamins are nutrients that your body cannot make on its own (or in enough amounts), so you must get them from food or supplements. Essential vitamins support growth, immunity, energy production, and repair of body tissues. Vitamin A can be found in food and supplements.

What are the different types of vitamin A?

“Preformed” vitamin A is found in animal foods like liver, eggs, fish, and dairy. Preformed vitamin A is ready for the body to use right away.

“Provitamin” A is found in plant foods like leafy greens, tomatoes, and orange or yellow fruits and vegetables (such as carrots, corn, and squash). The body changes provitamin A into vitamin A that it can use.

There are some medications that are forms of vitamin A called retinoids. Medications that are made from vitamin A act differently in the body than supplements and multivitamins that contain vitamin A. For information on retinoid medications, see our fact sheets on topical tretinoin here: https://mothertobaby.org/fact-sheets/tretinoin-retin-a-pregnancy/ and isotretinoin here: https://mothertobaby.org/fact-sheets/isotretinoin-accutane-pregnancy/.

In supplements and multivitamins, vitamin A can be found as preformed vitamin A (such as retinyl acetate, retinyl palmitate), provitamin A (beta carotene), or a combination of both. Preformed vitamin A can quickly build up in the body to toxic (harmful) amounts if too much is taken. Provitamin A from beta carotene does not result in vitamin A buildup, because the body controls the rate at which beta carotene is changed to vitamin A.

How much vitamin A do I need?

The Recommended Dietary Allowance (RDA) of vitamin A is the amount that most people should aim to get each day. The Tolerable Upper Intake Level (UL) is the highest level of daily intake that is not expected to increase health risks for most people. If your vitamin A intake is not meeting the Recommended Dietary Allowance (below), talk with your healthcare provider about taking a supplement. Some prenatal vitamins contain vitamin A.

Talk with your healthcare providers about all supplements/vitamins that you take. Have the bottles or photos of the labels with you so that all ingredients and their amounts can be seen. Your provider can review the total amount of vitamin A and other nutrients in the products and compare them to the recommended amounts.

Vitamin A intake during pregnancy:

Age	Recommended Dietary Allowance (RDA)	Upper Limit (UL)*
Pregnant and age 14 to 18 years old	750 mcg RAE^ / 2,500 IU⌂	2,800 mcg

Pregnant and age 19 years or older	770 mcg RAE / 2,566 IU	3,000 mcg

*The Upper Limits listed in this table only apply to products from animal sources and supplements where the vitamin A comes entirely from retinol and its forms ("preformed vitamin A"). Some supplements may have only provitamin A (like beta carotene), only preformed vitamin A (retinol), or a blend of both. From the supplement label, the percentage of retinol (or retinyl ester) should be used to calculate the vitamin A intake and whether it exceeds the Upper Limit.

⌂ IU – International Units.

^ RAE – Retinol Activity Equivalents. RAE is the current unit of measurement for vitamin A.

It is typically not recommended to take more than the RDA of vitamin A unless directed to do so by your healthcare provider. When looking at your daily intake, remember to count the amounts of vitamin A in foods, drinks, and supplements (including prenatal vitamins). Resources that list the amounts of vitamin A typically found in foods are available online, such as the United States Department of Agriculture (USDA) National Nutrient Database: https://ods.od.nih.gov/factsheets/list-all/. The amount of vitamin A in supplements is listed on the product label. Be sure to talk with your healthcare provider about your specific nutritional needs before, during, and after pregnancy.

I take vitamin A. Can it make it harder for me to get pregnant?

It is not known if taking the recommended amount or more than the recommended amount of vitamin A can make it harder to get pregnant. Not getting enough vitamin A might be linked to infertility (trouble getting pregnant).

Does taking vitamin A increase the chance of miscarriage?

Miscarriage is common and can occur in any pregnancy for many different reasons. Studies have not been done to see if having vitamin A deficiency, taking the recommended amount of vitamin A, or taking more than the recommended amount of vitamin A can increase the chance of miscarriage.

Does taking vitamin A increase the chance of birth defects?

Birth defects can happen in any pregnancy for different reasons. Out of all babies born each year, about 3 out of 100 (3%) will have a birth defect. We look at research studies to try to understand if an exposure, like vitamin A, might increase the chance of birth defects in a pregnancy. Taking more than 20,000 IU of vitamin A per day, especially preformed vitamin A, has been linked in some studies to an increased chance of birth defects.

The concern with too much vitamin A is that retinol-based medications can increase the chance of birth defects. However, this risk has not been clearly linked to vitamin A supplements, particularly those with beta-carotene. While studies show mixed results on whether extra vitamin A from supplements can increase the chance of birth defects, the form of vitamin A could matter. Preformed vitamin A (retinol) in high doses is more concerning than beta-carotene. The body only converts beta-carotene to retinol as needed. It is important to follow dosage guidelines and consult a healthcare provider during pregnancy.

Taking too much preformed vitamin A (more than the recommended limit) or not getting enough vitamin A might increase the chance of birth defects. It is usually suggested to meet the Recommended Dietary Allowance and avoid doses above 10,000 IU per day unless otherwise directed by your healthcare provider.

Some studies suggest the chance of birth defects might increase at levels of preformed vitamin A of 10,000 IU/day, while other studies have found no increased chance of birth defects unless the dose was above 25,000 IU/day. One study reported a link between an intake of 10,000 IU/day of vitamin A from supplements (not food) and an increased chance of some heart defects. One case report described a child with birth defects after exposure to daily doses of 150,000 IU of vitamin A during pregnancy to treat acne (the specific form of vitamin A used was not reported). The birth defects included microcephaly (a small head), brain changes including enlarged brain

ventricles, small adrenal glands, and underdeveloped kidneys. However, 2 other studies found no increase in birth defects in general or in brain defects with preformed vitamin A intakes of greater than 10,000 IU/day.

Some information suggests that vitamin A deficiency can increase the chance of certain birth defects, such as congenital diaphragmatic hernia (when the muscles that separate the chest from the abdomen [diaphragm] do not fully develop, leaving a hole). This allows abdominal organs, such as the stomach, liver, and intestines, to move into the chest cavity, which could affect lung development.

Does taking vitamin A in pregnancy increase the chance of other pregnancy-related problems?

Taking vitamin A in the recommended amounts is not expected to increase the chance of other pregnancy-related problems, such as preterm delivery (birth before week 37) or low birth weight (weighing less than 5 pounds, 8 ounces [2500 grams] at birth). It is not known if taking more than the recommended amounts of vitamin A can increase the chance of pregnancy-related complications.

Vitamin A deficiency during pregnancy has been linked to lower hemoglobin (protein in blood that moves oxygen through the body) levels in both the mother and the fetal cord blood. This can increase the chance of anemia (low levels of hemoglobin, leading to low levels of oxygen in the body), infections, and heavy bleeding in the mother, as well as low birth weight, increased chance of preterm delivery, and a weakened immune system for the baby.

Does taking vitamin A in pregnancy affect future behavior or learning for the child?

Taking vitamin A in the recommended amounts is not expected to affect future behavior or learning for the child. A study of children exposed to 23,000 IU of vitamin A before birth and as newborns found no effects on intelligence, memory, or motor skills at age 8.

Vitamin A deficiency during pregnancy has been linked to lower hemoglobin levels in both the mother and the fetal cord blood. This can lower iron stores in the fetal body, which can affect growth and brain development.

What screenings or tests are available to see if my pregnancy has birth defects or other issues?

Prenatal ultrasounds can be used to screen for some birth defects, such as heart or brain defects. Ultrasound can also be used to watch the growth of the pregnancy. Talk with your healthcare provider about any prenatal screenings or testing that are available to you. There are no tests available during pregnancy that can tell how much effect there could be on future behavior or learning.

Breastfeeding while taking vitamin A:

Vitamin A passes into breast milk in small amounts and is a typical part of breast milk. Women who are breastfeeding should continue to get the daily recommended amount of vitamin A unless otherwise directed by their healthcare provider.

Age	Recommended Dietary Allowance (RDA)	Upper Limit (UL) for Preformed Vitamin A
Breastfeeding and age 14 to 18 years old	1,200 mcg RAE / 4,000 IU	2,800 mcg

Breastfeeding and age 19 years or older	1,300 mcg RAE / 4,333 IU	3,000 mcg

Talk with your healthcare provider and your child's pediatrician about your and your child's specific nutritional needs before, during, and after breastfeeding. Be sure to talk to your healthcare provider about all your breastfeeding questions.

If a man takes vitamin A, could it affect fertility or increase the chance of birth defects?

One study found that men with infertility had lower vitamin A levels in their semen compared to men without fertility issues. It is not known if taking the recommended amount or more than the recommended amount of vitamin A can affect men's fertility (ability to make healthy sperm) or increase the chance of birth defects. In general, exposures that fathers or sperm donors have are unlikely to increase risks to a pregnancy. For more information, please see the MotherToBaby fact sheet Paternal Exposures at https://mothertobaby.org/fact-sheets/paternal-exposures-pregnancy/.

Please click here for references.