

VITAMIN A & fetal development



Modern Day Epidemics & Lack of Nutrients

Epidemics such as allergies, asthma and autism are plaguing our children. Studies have shown that these modern epidemics, as well as our health later in life, are connected to the quality of health and development in the womb. Our culture is curbed more towards calorie counting than nutrient density, with our health taking a true toll. Through extensive travel and study, Dr. Weston A Price saw that primitive cultures experienced total wellness through nutrient-dense, high quality foods such as organ meats, fatty fish and raw dairy. High in “fat-soluble activators,” vitamin A acted as one of these vital nutrients. Paired with modern science and understanding its role in fetal development, we are able to uncover the power and need for more quality sources in our own diets.

Thesis Statement: How does the consumption or mal-consumption, digestion or mal-digestion of vitamin A during pregnancy affect the growth and development of a fetus?

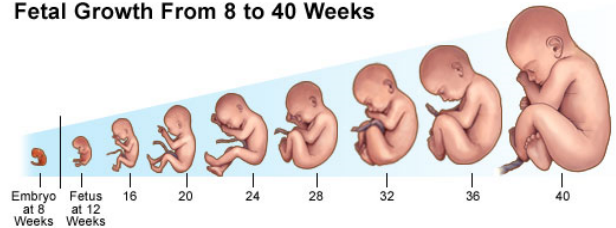
Functional Vitamin A Deficiency

Dr. Natasha Campbell McBride details how an unhealthy diet and poor gut health can lead to a functional deficiency of Vitamin A. In these cases, toxins fleaking into the bloodstream from the gut end up attaching themselves to retinoid receptors in the body. Therefore, vitamin A is unable to be used. One may see high vitamin A levels on blood tests, when really the body is deficient and starving for these molecules.

Vitamin A is...

- Fat-soluble: meaning “able to be dissolved.” It is transported in fat, is stored in fat, and removed from the body in fat
- Found in different forms - Retinol, all-trans-retinoic acid, carotenoids and retinyl acetate, to name a few - all of which are different and detailed throughout this handout.
- A potent antioxidant and anti-infective agent
- An important player in fertility & fetal development

Fetal Growth From 8 to 40 Weeks



Vitamin A plays a significant role in orchestrating embryo & fetal growth – it is vital for cellular growth and differentiation, hindbrain formation, circulation, formation of the primitive heart, central nervous system, skeletal system, skull and limbs¹

Provitamin A - Water Soluble Carotenoids

It's important to know that carotenoids - most famously beta-carotene and alpha-carotene found in plants - are **PRECURSORS** to Vitamin A. Our body needs to convert beta-carotene into retinol - the active form - before it can be used as a true vitamin A source. Although carotenoids themselves, without conversion, have shown anti-cancer properties, there are also various factors that can inhibit or enhance the digestion, absorption and utilization of these plant pigments into retinol:

- **A 12:1 efficacy of conversion was seen in one study³ – in women, conversion is lower and more variable...**
- **Infants unable to convert beta-carotene to retinol, and in children it's poor⁴**
- **The food matrix of the plant, the health of our gut and liver, as well the presence of FAT with the meal - to initiate the release of bile salts - all effect efficacy of conversion in that individual.^{5,6,7}**
- **A genetic polymorphism of gene B-carotene 15, 15'-monooxygenase⁷**
- **Excessive iron consumption, zinc deficiency⁴**

These individualized factors should deter one from totally depending on carotenoids for Vitamin A. We should 1) eat quality fats (butter, ghee, lard, olive oil, etc) with carotenoid plant sources to enhance digestion/absorption. E.g. sauté spinach in butter or puree cooked apples with ghee. Carotenoids, even when eaten in large amounts, are not toxic at any level.

Synthetic Vitamin A Derivatives

Retinyl Acetate, Palmitate - found abundantly in fortified foods & supplements. Synthetic beta-carotene, found in supplements...

Most likely one of the most consumed sources of vitamin A in our society. They're added to breads, cereals, margarines, low-fat milk and other processed foods. Check labels for whole food sources of vitamins - especially in your prenatal vitamin - as research/studies point much more in favor of these:

- **Natural vs. synthetic beta-carotene in suppl: Natural = better results.² (Isomers of vitamin A work synergistically, have co-factors and enzymes)**
- **Isolated and derived from a man-made process**
- **Synthetic vitamins may inhibit the functioning of natural vitamin A**

Provitamin A - Animal Sources of Retinol

Retinol can be found in animal sources of foods such as liver, dairy, eggs and seafoods. This form is directly bioavailable, with a 60-70% absorptive rate from the digestive tract. It can be directly converted into retinyl esters (inactive storage form), retinal (vision, growth) or retinoic acid (skin health, tooth remineralization, bone growth), all of which are important metabolic forms. Whole, raw milk (not low-fat and fortified with synthetic vitamin A), pastured butter, shrimp, salmon and cod liver oil are great, quality sources of vitamin A retinol. Dr. Price noted that all Indigenous cultures relied heavily on "fat-soluble activators" - Vitamin A being one if the three - for total health and happiness...



Vitamin A in Primitive Cultures

The travels and studies detailed in Dr. Weston A. Price's book "*Nutrition and Physical Degeneration*" described all indigenous cultures consuming numerous amounts of dairy, organ meats and/or seafoods - all of which are high, quality sources of preformed vitamin A. Calculations equate to about 50,000 IU's of Vitamin A/day - **about 10X more vitamin A than modern populations!** Preparations for pregnancy would include:

- Gaelic fisherman - fish heads stuffed with liver and oats
- Eskimos - fish, roe, seal oil and blubber
- South sea islanders - reproductive organs of the shark

"Early books on the feeding of pregnant women and infants recommended generous doses of cod liver oil and frequent liver consumption for pregnant women and two teaspoons of cod liver oil per day for babies three months and older"⁴



Toxicity, Birth Defects - The form of Vitamin A Matters

Studies linking birth defects to vitamin A stem from synthetic sources - retinol, accutane (12-cis-retinoic-acid), and other derivatives are the culprits. The only whole food source of vitamin A toxicity (*not* birth defect related) was the apparent consumption of one million units of polar bear or seal liver — symptoms cleared up after discontinuation.⁸ Sally Fallon notes that even "*synthetic vitamin A is not toxic when given as a single large dose or in small amounts on a daily basis.*" A 1995 study paved a wave of fear in the community when it was concluded that "10,000 IU's of Vitamin A/day in the first 7 weeks of pregnancy was correlated with birth defects. Again, Sally Fallon makes many great points surrounding these conclusions in her article "Vitamin A Saga," mentioning "*teratogenic effects of commercial vitamin-A preparations (may be) exacerbated in women whose dietary practices and general health status are poor.*" Various studies linking vitamin A deficiencies to birth defects are outlined in my thesis paper, which produce very similar symptoms. Additionally, it is vital to keep vitamin A levels in BALANCE with vitamin D - these two work together in the body - as well as prevent toxicity in each other.¹⁰

VITAMIN A IS NECESSARY FOR HORMONAL BALANCE, PLAYS A ROLE IN CURBING PMS, AS WELL AS BUILDING FERTILITY AND MAINTAINING PREGNANCY EVEN BEFORE WE MAY KNOW WE ARE WITH CHILD. THE FETUS RAPIDLY USES UP VITAMIN A, AND RETINOID RECEPTORS ARE ABUNDANT ALL ALONG THE DEVELOPING VERTEBRAE.⁹ THE CURRENT RDA FOR PREGNANT WOMEN IS 2600 IU'S OF RETINOL/DAY, BUT INSTEAD BE AWARE OF WHERE YOU'RE GETTING YOUR VITAMIN A FROM. FORGO MARGARINE AND BREAKFAST CEREALS AND OPT FOR REAL, WHOLE FOOD SOURCES - COD LIVER OIL, LIVER, BUTTER AND FISH, AS WELL AS PLENTY OF PLANT FOODS WITH ADDED FATS. YOUR BABY, AND BODY, WILL THANK YOU!

Sources: 1. Unicef. (2018, May 2). *Vitamin A supplementation interactive dashboard*. Retrieved from UNICEF: <https://data.unicef.org/resources/vitamin-supplementation-interactive-dashboard/>. 2. Ben-Amotz A, L. Y. (2006). Bioavailability of a natural isomer mixture compared with synthetic all-trans beta-carotene in human serum. *American Journal of Clinical Nutrition*, 729-34. 3. Spiegler E, K. Y. (2012). Maternal-fetal transfer and metabolism of vitamin A and its precursor β -carotene in the developing tissues. *Biochim Biophys Acta*. 4. Fallon S, E. M. (n.d.). (2002) *Vitamin A Saga*. Retrieved from The Weston A. Price Foundation: <https://www.westonaprice.org/health-topics/abcs-of-nutrition/vitamin-a-saga/>. 5. The Linus Pauling Institute Micronutrient Center. (2016). α -Carotene, β -Carotene, β -Cryptoxanthin, Lycopene, Lutein, and Zeaxanthin. Retrieved from Oregon State University : <http://lpi.oregonstate.edu/mic/dietary-factors/phytochemicals/carotenoids#food-sources>. 6. National Science Foundation . (n.d.). Vitamin A: β -Carotene. Retrieved from Chemistry Libretexts: https://chem.libretexts.org/Core/Biological_Chemistry/Vitamins

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