

The Vitamin A Mistake That Changed The Natural Products Industry

By Michael Mooney, June, 2010

Several years ago, New Chapter®, one of the most popular vitamin manufacturers in the natural products industry, put notes on their vitamin labels that said "Retinol-Free," while also placing a statement on their web site that I reproduce below.

While well-intentioned, New Chapter® misinterpreted a study that said vitamin A could cause birth defects that was found to be in error by the World Health Organization.¹

Because of New Chapter®'s prominence in the vitamin industry, dozens of other companies followed their lead and removed real retinol vitamin A from their formulas and substituted beta carotene, a precursor to retinol that is not absorbed or converted into vitamin A adequately by almost half the population.^{2 3} It is also too poorly converted in the body into vitamin A to substitute for retinol.^{4 5 6}

This is the statement New Chapter® made about their reason for eliminating retinol vitamin A from their vitamin formulas, while substituting beta carotene for real retinol vitamin A.

First, what we know, with a fair degree of confidence, about Vitamin A:

1. If a person doesn't have enough Vitamin A, a chronic deficiency can lead to eye inflammation, deterioration, and blindness. Vitamin A deficiencies can manifest, in their most benign forms, as simply dry hair and dry or broken nails. Vitamin A promotes protein synthesis and cell differentiation, helps to regulate our immune systems, helps to maintain the surface linings of the intestinal, urinary, and reproductive tracts, and it plays an important role in promoting the integrity of skin and mucus membranes. It is important to note that Vitamin A deficiencies are extremely rare in the United States and the developed world, for the vitamin is richly present in dairy, beef or chicken liver, and a host of fortified foods;
2. **We also strangely know, for sure, that there is an inconsistency in the public scientific record on the RDA for Vitamin A.** The FDA has an RDA labeling standard of 5,000 IU (1515 micrograms or mcg, on a conversion ratio of one microgram of retinol or its equivalent equaling approximately 3.3 IU of Vitamin A) and the National Academy of Sciences recommends 700 mcg (2,330 IU) per day for women, 800 mcg (2,640 IU) per day for pregnant women, and 900 mcg (3,000 IU) for men, with a "tolerable upper limit" of 3,000 mcg/day for both men and women (approximately 10,000 IU).
3. Finally, we know with strong conviction that too much Vitamin A (from either foods like beef and chicken liver or supplemental Vitamin A palmitate/retinol sources can, on a chronic basis, be **highly toxic** and lead to:
4. Birth Defects, for **one study** [by Rothman] has indicated that even modestly excessive chronic intake of Vitamin A from retinol (10,000 IU daily) has potentially teratogenic (fetal deformity) effects if consumed in sensitive periods of pregnancy, especially prior to the seventh week. **In 2000, a comprehensive article entitled "Retinoids in Embryonal Development" authored by scientists from the FDA, the National Cancer Institute, the National Institutes of Health, and Harvard Medical School reported that a prospective study on 22,000 pregnant women found "an association between the consumption of >10,000 IU vitamin A/day from supplements and an increased risk of birth defects of all types.";**

5. Hypervitaminosis A in animals during a growth stage can lead to bone fractures and skeletal abnormalities; and
6. In adult humans, chronic hypervitaminosis A has been associated with progressive calcification of ligaments, increased bone resorption, osteoporosis, migratory arthritis, hepatosplenomegaly, and increased intracranial pressure with secondary papilledema and/or diplopia. On an acute basis, toxic levels of Vitamin A can lead to nausea, vomiting, dizziness, blurred vision, and muscular un-coordination.

COMMENT: While their intention was for the public good, New Chapter® caused tremendous confusion in the natural products industry when they misinterpreted the statement of the Ross study that included researchers from the FDA, National Cancer Institute, National Institutes of Health and Harvard Medical School.⁷

These scientists dismissed the Rothman study⁸ that said that vitamin A above 10,000 IU/day could cause "fetal deformity" (birth defects).

They said, "...there are a number of methodological questions concerning the study that prevent reaching the conclusion that the dosages of vitamin A (10,000 IU) examined in the study cause certain types of birth defects."⁷

The World Health Organization also dismissed the Rothman study and went even further, stating that birth defects could only occur at dosages of vitamin A above 30,000 IU.¹

Vitamin A Can Decrease Risk of Birth Defects: World Health Organization's Statement

In dismissing the Rothman study, the World Health Organization added, "*Recent studies strongly suggest that periconceptual supplements of vitamin A that are close to, but less than 10,000 IU/day, and that are given as a component of a multivitamin, are much more likely to be associated with reduced, rather than increased, risk of malformations.*"¹

No Toxic Vitamin A In Any Multivitamin Sold in the USA

While well-intentioned, New Chapter® misunderstood what dose could cause vitamin A toxicity. The National Academy of Sciences Institute of Medicine's Lowest Observed Adverse Effect Level (LOAEL) for vitamin A, which is the dose where toxicity may occur for a small group of people when taken long-term is 21,600 IU.

Since no multivitamin sold in the USA contains more than 5,000 IU of vitamin A, there is no multivitamin with "toxic" vitamin A in the United States.

Beta Carotene Cannot Substitute for Real Retinol Vitamin A

Multi-vitamins that have substituted beta carotene for real retinol vitamin A can cause a vitamin A deficiency in those who take them, as beta carotene cannot adequately substitute for retinol vitamin A for the majority of people.

Where it was previously thought that beta carotene conversion into retinol in the body was 6 to 1, so 12,000 IU of beta carotene would convert to 2,000 IU of retinol vitamin A, we now know that conversion can be as low as 29 to 1.⁴⁵⁶ This means that 12,000 IU of beta carotene would convert into only 413 IU of vitamin A, too little to adequately supply the Recommended Daily Value for vitamin A for adults, which is 5,000 IU per day.

Bring Vitamin A Back!

Only a few vitamin manufacturers have kept real retinol vitamin A in their vitamin formulas, while at the same time supplying beta carotene for its antioxidant value. This is a call for all vitamin manufacturers to bring vitamin A back.

¹ World Health Organization Micronutrient Initiative. Safe vitamin A dosage during pregnancy and lactation. World Health Organization 1998 WHO/Nut/98.4.

² Lin Y, and associates. Variability of the conversion of beta-carotene to Vitamin A in women measured by using a double-tracer study design. American Journal of Clinical Nutrition 2000 Jun;71(6):1545-54.

³ Hickenbottom SJ, and associates. Variability in conversion of β -carotene to Vitamin A in men as measured by using a double-tracer study design. American Journal of Clinical Nutrition 2002 May;75(5): 900-907.

⁴ Tang G. Bioconversion of dietary provitamin A carotenoids to vitamin A in humans. American Journal of Clinical Nutrition 2010 Mar 3.

⁵ Solomons NW. Plant sources of proVitamin A and human nutriture: How much is still too little? Nutrition Reviews 1999 Nov;57(11):350-361.

⁶ Hickenbottom SJ, and associates. Variability in conversion of β -carotene to Vitamin A in men as measured by using a double-tracer study design. American Journal of Clinical Nutrition 2002 May;75(5): 900-907.

⁷ Ross SA and associates. Retinoids in embryonal development. Physiological Reviews, Vol. 80, No. 3, July 2000, pp. 1021-1054.

⁸ Rothman K, and associates. Teratogenicity of high vitamin A intake. New England Journal of Medicine 1995 Nov 23; 333 (21); 1-5.