



Basic Health Info

Supplement Facts Label Updates

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Supplement Facts labels can be confusing to say the least. How much of each substance is in a product? Is the source of the supplement natural or synthetic? And what exactly is an International Unit (IU) anyway? In January 2020, the units of measurement for most fat-soluble vitamins changed. I was asked about the label changes before I actually noticed it myself. The IUs are gone, replaced with the weights of vitamins in milligrams (mg) and micrograms (mcg). This Health Info will explain what happened and why, plus give you conversion factors for IUs to the weights in case you have products with labels prior to January 1, 2020.

In 2016, the U.S. Food and Drug Administration (FDA) modified the rules for reporting label amounts of vitamins in foods and supplements. The Recommended Dietary Allowances (RDAs) were changing and the FDA wanted to standardize the units of measurement. The IU represented the biological activity of the vitamin. The problem was that the source of the vitamin could impact the actual amount of the active vitamin in the supplement and thus, the biological activity. The new recommendations also apply to vitamins in food as well, but we'll stick to the Supplement Facts labels for this Health Info.

The information I'm providing comes from two documents created by the FDA to guide the food and supplement manufacturers. I'll simplify what they said and provide conversion factors to make it easy to do the calculations for yourself if you want to.

Returning to 2016, the FDA amended the regulations for the nutrition labeling of conventional foods and dietary supplements. They updated the Daily Values for folate, niacin, vitamin A, vitamin D, and vitamin E because further information was available from nutrition research. If you want an explanation of the Daily Value, check out the Basic Health Info titled Daily Value.

When the Institutes of Medicine updated the RDAs, they updated the units of measurement for the vitamins I mentioned earlier. Most vitamins did not need changing, but to reflect the different biological activity of different forms of the vitamins reported in IIs, units of measurement had to be changed. Those changes are what we now see on the Supplement Facts labels or will soon.

Niacin

Let's begin with niacin and it will be a short stop. Niacin was always reported in mg on supplement labels; the change will primarily

Supplement Facts		
Serving Size 1 Tablet		
Servings Per Container 60		
Amount Per Serving		% Daily Value
Vitamin A	900 mcg	100%
Vitamin C	90 mg	100%
Vitamin D	20 mcg	100%
Vitamin E	15 mg	100%
Thiamin	1.2 mg	100%
Riboflavin	1.3 mg	100%
Niacin	16 mg	100%
Vitamin B6	1.7 mg	100%
Folate	680 mcg DFE (400 mcg folic acid)	170%
Vitamin B12	2.4 mcg	100%
Biotin	30 mcg	100%
Pantothenic Acid	5 mg	100%
Choline	550 mg	100%
Fluoride	20 mg	†
† Daily Value not established		

Supplement Facts		
Serving Size 1 Tablet		
	Amount Per Serving	% Daily Value
Vitamin A (as retinyl acetate and 50% as beta-carotene)	5000 IU	100%
Vitamin C (as ascorbic acid)	60 mg	100%
Vitamin D (as cholecalciferol)	400 IU	100%
Vitamin E (as di-alpha tocopheryl acetate)	30 IU	100%
Thiamin (as thiamin mononitrate)	1.5 mg	100%
Riboflavin	1.7 mg	100%
Niacin (as niacinamide)	20 mg	100%
Vitamin B6 (as pyridoxine hydrochloride)	2.0 mg	100%
Folate (as folic acid)	400 mcg	100%
Vitamin B12 (as cyanocobalamin)	6 mcg	100%
Biotin	30 mcg	10%
Pantothenic Acid (as calcium pantothenate)	10 mg	100%



impact food labels. One mg of niacin equals one mg of niacin. However, in foods that contain the amino acid tryptophan, additional niacin is available. The conversion would be the amount of niacin in mg plus the amount of tryptophan in mg divided by 60. Protein bars are considered supplements, so that may be where this change impacts the amount of available niacin. For the multivitamins and B-complex vitamins we take, it would make no difference.

Folate

Folate is also impacted even though it was always reported in mcg. There's a difference in the way folate from foods and supplements and folic acid from foods and supplements are utilized by the body. To make sure that consumers know how much of the active ingredients they will actually be getting, the forms of folate will be reflected in mcg Dietary Folate Equivalents or DFE. Manufacturers don't have to use the DFE after the mcg, so you may not see that nomenclature.

This is the difference. For folate, the natural form, one mcg will equal one mcg DFE. For folic acid, which is absorbed much better, one mcg folic acid will be multiplied by 1.7 to indicate the mcg in DFE units. Simply stated, you need less folic acid than folate because of the absorption difference. You'll know anyway because the form of folate will be indicated on the label.

Vitamin A

Turning to the fat-soluble vitamins, the ones that have reported amounts in IUs, let's begin with vitamin A or retinol. There's a new unit of measure, the Retinol Activity Equivalents or RAE. This one is the most complex yet; the new recommendations considers vitamin A, also known as retinol, but also beta carotene from supplements, beta-carotene from foods, and the carotenoids alpha-carotene and beta-cryptoxanthin, which can be turned into vitamin A.

In short, the conversion to mcg recognizes that retinol is the standard for vitamin A activity, but pro-vitamin A isn't vitamin A yet, but it can be converted to vitamin A; it just takes more of it to yield the same activity. If we start with converting vitamin A in IUs to mcg, multiply the IUs by 0.3; 1,000 IUs of vitamin A as retinol would be 300 mcg. Supplemental beta carotene would also be 300 mcg. However, beta-carotene from food would be just 50 mcg, and 1,000 IU of carotenoids would be just 25 mcg retinol.

This would be the equivalence in mcg.

1 mcg RAE = 1 mcg preformed vitamin A (retinol)
 = 2 mcg supplemental β -carotene
 = 12 mcg dietary β -carotene
 = 24 mcg of carotenoids such as
 α -carotene or β -cryptoxanthin

Vitamin D

Vitamin D, also known as calciferol, contains only two major forms: vitamin D2, known as ergocalciferol, and vitamin D3, called cholecalciferol. There's no difference in the biological activity of either form; 1 IU of vitamin D has the activity of 0.025 mcg of vitamin D3 and vitamin D2. That means 1,000 IU vitamin D is equal to 25 mcg vitamin D. That's pretty easy compared to vitamin A.



Vitamin E

There's a substantial difference in biological activity between natural vitamin E and synthetic vitamin E. Synthetic vitamin E has eight different stereoisomers; one isomer is the natural form, three isomers are synthetic, and four reverse isomers have no biological activity of a positive or negative nature that we know. The only form of vitamin E that's active is the natural form.

To convert vitamin E from IUs, the IUs of the natural vitamin E would be multiplied by 0.67; if it were synthetic vitamin E it would be multiplied by only 0.45. How would you know which is which? The label would say d-alpha tocopherol if it were natural vitamin E, and dl-alpha tocopherol if it were synthetic. 100 IUs natural vitamin E would be 67 mg while synthetic vitamin E would be just 45 mg.



The Bottom Line

That's how we'll work with the updated units found on Supplement Facts labels. They're not new, just consistent with the units already used for almost all other vitamins found in supplements, so it should make understanding supplements easier. Whether you see it on your supplement labels or not depends on product sales of the brands you buy. If the manufacturer has sales of over \$10 million per year, they had to comply by January 1, 2020; if they have lower sales, they will have an additional year to comply.

