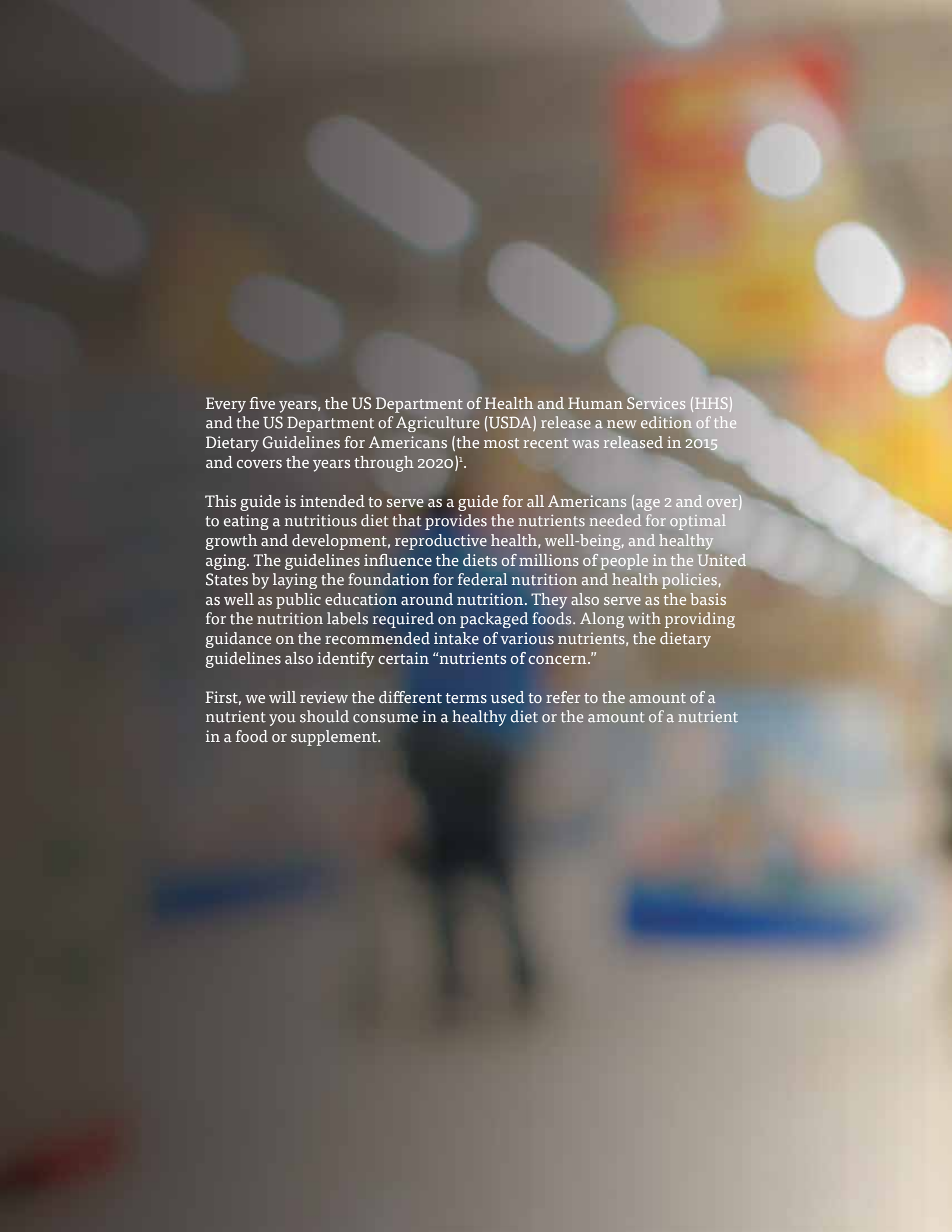
Nutrients of Concern:

What Food Manufacturers Need to Know



Every five years, the US Department of Health and Human Services (HHS) and the US Department of Agriculture (USDA) release a new edition of the Dietary Guidelines for Americans (the most recent was released in 2015 and covers the years through 2020)[1].

This guide is intended to serve as a guide for all Americans (age 2 and over) to eating a nutritious diet that provides the nutrients needed for optimal growth and development, reproductive health, well-being, and healthy aging. The guidelines influence the diets of millions of people in the United States by laying the foundation for federal nutrition and health policies, as well as public education around nutrition. They also serve as the basis for the nutrition labels required on packaged foods. Along with providing guidance on the recommended intake of various nutrients, the dietary guidelines also identify certain "nutrients of concern."

First, we will review the different terms used to refer to the amount of a nutrient you should consume in a healthy diet or the amount of a nutrient in a food or supplement.

RDA's vs. DV's

Many different terms are used to refer to either the amount of a nutrient you should consume or the amount of a nutrient in a food or dietary supplement. Two of the most common are the Recommended Dietary Allowance (RDA) and the Daily Value (DV).

RDAs are recommended daily intakes of a nutrient for healthy people. This is the amount of a nutrient such as a vitamin or mineral that you need to consume each day to maintain health. The RDAs were developed by the Food and Nutrition Board at the Institute of Medicine of the National Academies. They vary by age and gender. There are also specific RDA's for women that are pregnant or breastfeeding. Therefore there are several different RDAs for each nutrient.

The DVs were established by the U.S. Food and Drug Administration (FDA). They were designed to be used on food and dietary supplement labels. Unlike RDA's, there is one DV for each nutrient for all people ages 4 years and older. DVs are not recommended intakes. DV's indicate how much of a nutrient is in a serving of food or a dietary supplement in the context of a total daily diet. DVs often match or exceed the RDAs for most people, but not in all cases.

DVs are shown on food and supplement label as a percentage. This allows consumers to easily compare one product to another in terms of nutrient values. For example, the DV for Iodine is 150 mcg. If a product label says it contains 10% of the DV for Iodine it would contain 15 mcg. If another products said it contained 20% of the DV for Iodine, it is easy to see that the second product contains twice as much Iodine(30 mg.)

Table of Daily Value Changes

Nutrients are listed in the order in which they appear on the supplement facts panel.

Nutrient	Previous Daily Value	New Daily Value
Vitamin A	5000 IU	900 mcg RAE*
Vitamin C (ascorbic acid)	60 mg	90 mg
Vitamin D	400 IU	20 mcg †
Vitamin E	30 IU	15 mg alpha-tocopherol*
Vitamin K	80 mcg	120 mcg ‡
Thiamin (Vitamin B1)	1.5 mg	1.2 mg
Riboflavin (Vitamin B2)	1.7 mg	1.3 mg
Niacin (Vitamin B3)	20 mg	16 mg*
Vitamin B6	2 mg	1.7 mg
Folate & Folic Acid	400 mcg	400 mcg DFE*
Vitamin B12	6 mcg	2.4 mcg
Biotin	300 mcg	30 mcg
Pantothenic Acid	10 mg	5 mg
Choline	N/A	550 mg
Calcium	1000 mg	1300 mg
Iron	18 mg	18 mg
Phosphorus	1000 mg	1250 mg
Iodine	150 mcg	150 mcg
Magnesium	400 mg	420 mg
Zinc	15 mg	11 mg
Selenium	70 mcg	55 mcg
Copper	2 mg	0.9 mg
Manganese	2 mg	2.3 mg
Chromium	120 mcg	35 mcg
Molybdenum	75 mcg	45 mcg
Chloride	3400 mg	2300 mg
Sodium	2400 mg	2300 mg
Potassium	3500 mg	4700 mg

* See Unit Conversions † Can voluntarily declare in International Units ‡ See Further Nutrient Discussion

What Is a Nutrient of Concern?

Nutrients of concern are nutrients that are typically either over-consumed or under-consumed based on the Recommended Dietary Allowance (RDA), which provides either the minimum level or the maximum level of consumption required to prevent detrimental effects on health. The diet of many Americans lacks in fruits, vegetables, dairy, whole grains, and seafood, which can lead to under-consumption of certain key nutrients.

The most recent Dietary Guidelines for Americans added five important nutrients to the list of nutrients of concern due to under-consumption. These include calcium, potassium, iron, dietary fiber, and vitamin D. All are considered "shortfall nutrients" because either the average American doesn't get enough to stave off negative effects or a particular segment of the population (such as women or children) tend to be deficient.

Calcium

Because calcium is so important, many common foods are fortified with extra doses of the mineral.

Calcium is a key mineral that is needed for building and maintaining healthy bones. Calcium also plays an important role in vascular contraction, and vasodilation, muscle function, nerve transmission, intracellular signaling, and hormonal secretion. Studies have shown that primary risk factors associated with insufficient calcium levels include softened or brittle bones, bone fractures, osteoporosis, and even dental problems.[2]

Calcium is found naturally in many foods, especially milk and products made from milk (like cheese and yogurt) and fish with soft bones that you eat like sardines and salmon. Green vegetables like kale and broccoli also contain calcium. Because calcium is so important, many common foods are fortified with extra doses of the mineral. Breakfast cereal, fruit juice, and dairy substitutes like rice milk and soy milk are often fortified with calcium.

According to the Dietary Guidelines for Americans, the RDA of calcium for most people is between 1000 and 1300 milligrams of calcium per day, but many people fall short of that goal, says The National Institutes of Health. Most Americans, in fact, are only getting about 75 percent of their recommended daily calcium intake through their diets.[3]

Daily Value 1300 mg*

Recommended Dietary Allowances (RDAs) for Calcium

Age	Male	Female	Pregnant	Lactating
0-6 months†	200 mg	200 mg		
7-12 month†	260 mg	260 mg		
1-3 years	700 mg	700 mg		
4-8 years	1,000 mg	1,000 mg		
9-13 years	1,300 mg	1,300 mg		
14-18 years	1,300 mg	1,300 mg	1,300 mg	1,300 mg
19-50 years	1,000 mg	1,000 mg	1,000 mg	1,000 mg
51-70 years	1,000 mg	1,200 mg		
71+ years	1,200 mg	1,200 mg		

*All values are from the new Nutrition Facts Label regulations.
† Adequate Intake (AI)

Potassium

...almost no one consumes the minimum amount of potassium recommended.

Getting enough potassium, according to public health officials, can significantly cut your risk of high blood pressure, heart disease, and stroke. Research suggests that consuming an optimal amount of this crucial mineral may protect against a host of ailments including cardiovascular disease, osteoporosis, and kidney stones. It can help to maintain healthy blood pressure and ensure proper nerve, kidney, and heart functions.[4]

Potassium is most commonly associated with bananas, which provide about 422 milligrams of potassium per serving, but other foods are actually much better sources of the mineral. A serving of sweet potato (1 medium sweet potato) delivers 694 milligrams. Other top sources include beet greens (655 milligrams of potassium per ½-cup cooked), white beans (595 milligrams of potassium per ½-cup serving), and nonfat yogurt (579 milligrams of potassium per 8-ounce serving). Another great source of potassium is potato skins. The skin of an average-sized baked potato provides just over 330 milligrams of potassium. In general, beans and peas, nuts and seeds, leafy green vegetables like spinach, cabbage, and parsley, and fruits like bananas, cantaloupe, papayas, raisins, and dates are potassium-rich.

According to the Dietary Guidelines for Americans, most adults should consume 4,700 milligrams of potassium each day, but according to The American Journal of Clinical Nutrition,[5] the average potassium intake for adults is far short of that at around 1,755 milligrams per day. According to the journal, fewer than 2 percent of US adults meet the daily requirement. That means that almost no one consumes the minimum amount of potassium recommended.

Daily Value **4700** **mg***

Adequate Intake (AI) for Potassium†

Age	Male	Female	Pregnant	Lactating
0-6 months	400 mg	400 mg		
7-12 month	700 mg	700 mg		
1-3 years	3,000 mg	3,000 mg		
4-8 years	3,800 mg	3,800 mg		
9-13 years	4,500 mg	4,500 mg		
14-18 years	4,700 mg	4,700 mg	4,700 mg	5,100 mg
19-50 years	4,700 mg	4,700 mg	4,700 mg	5,100 mg
51-70 years	4,700 mg	4,700 mg		
71+ years	4,700 mg	4,700 mg		

*All values are from the new Nutrition Facts Label regulations.
† Adequate Intake (AI)

Iron

Many cereals and grain products are fortified with iron.

Iron is a key mineral because it is essential for carrying oxygen around the tissues of the body through the bloodstream. Iron deficiency can cause anemia, the symptoms of which include fatigue, breathlessness, and heart palpitations.[6]

Good food sources of iron include red meat and meat products, dark green, leafy vegetables such as cabbage and spinach, and pulses such as lentils, beans, and chickpeas. Many cereals and grain products are fortified with iron.

The DV for Iron is 18 mg. The RDA for iron is 8 milligrams (225 % of the DV) for most adults, which most get through a typical diet. The amount of iron needed by infants, children, teens, pregnant women, and menstruating females of all ages, however, is much higher. These populations are at risk for iron deficiency, putting iron on the list of nutrients of concern.

Daily Value 18 mg*

Recommended Dietary Allowances (RDAs) for Iron

Age	Male	Female	Pregnant	Lactating
0-6 months†	0.27 mg	0.27 mg		
7-12 month†	11 mg	11 mg		
1-3 years	7 mg	7 mg		
4-8 years	10 mg	10 mg		
9-13 years	8 mg	8 mg		
14-18 years	11 mg	15 mg	27 mg	10 mg
19-50 years	8 mg	18 mg	27 mg	9 mg
51-70 years	8mg	8 mg		

*All values are from the new Nutrition Facts Label regulations.
† Adequate Intake (AI)

Dietary Fiber

The Daily Value for adults is 28 grams.

Dietary fiber is a non-digestible carbohydrate that is found in plant foods—fruits, vegetables, whole grains, beans, nuts, and seeds. Dietary fiber is important for healthy gastrointestinal function. A diet high in dietary fiber can also be beneficial for managing body weight, reducing the risk of cardiovascular disease and type 2 diabetes, and improving blood sugar levels in diabetes patients.[7]

The Daily Value for adults is 28 grams. The Dietary Guidelines for Americans identified dietary fiber as a nutrient of concern since the average consumption of dietary fiber among adults is just 15 grams.

Daily Value 28 g*

Adequate Intake (AI) for Dietary Fiber†

Age	Male	Female	Pregnancy	Lactation
1-3 years	19 g	19 g		
4-8 years	25 g	25 g		
9-13 years	31 g	26 g		
14-18 years	38 g	26 g	28 g	29 g
19-30 years	38 g	25 g	28 g	29 g
31-50 years	38 g	25 g	28 g	29 g
50-70 years	30 g	21 g		
70+ years	30 g	21 g		

*All values are from the new Nutrition Facts Label regulations.

† Note: This table (taken from the DRI reports, see www.nap.edu) presents the Adequate Intakes (AI) of Total Fiber. An AI is developed when there is insufficient evidence to establish an Estimated Average Requirement (EAR) from which a DRI is calculated. For healthy breast fed infants, an AI is the mean intake. The AI for other life stage and gender groups is believed to cover the needs of all healthy individuals in the groups, but lack of data or uncertainty in the data prevent being able to specify with confidence the percentage of individuals covered by this intake.

Vitamin D

Vitamin D can also be synthesized within the body when the sun's ultraviolet rays strike the skin.

Vitamin D is a fat-soluble vitamin that promotes the absorption of calcium and is important for bone growth and maintaining healthy bones. When the body doesn't get sufficient vitamin D, bones can become thin, brittle, and prone to fractures. Along with calcium, vitamin D also helps reduce the risk of osteoporosis.[8]

Vitamin D is naturally present in very few foods, such as fatty fish (salmon, tuna, mackerel) and fish liver oils. Small amounts of vitamin D can also be found in beef liver, cheese, and egg yolks. Most of the vitamin D in the typical American diet, however, comes from fortified foods, like milk and breakfast cereals. Vitamin D can also be synthesized within the body when the sun's ultraviolet rays strike the skin.

For most people, the RDA of vitamin D is 15 micrograms or 600 IU (10 micrograms or 400 IU for infants and 20 micrograms or 800 IU for adults over age 70). According to the Dietary Guidelines for Americans, though, most adults get less than half that amount from dietary sources.

Daily Value **20** **mcg*** *Equivalent to 800 IU*

Recommended Dietary Allowances (RDAs) for Vitamin D

Age	Male	Female	Pregnancy	Lactation
0-12 months	400 IU	400 IU		
1-13 years	600 IU	600 IU		
14-18 years	600 IU	600 IU	600 IU	600 IU
19-50 years	600 IU	600 IU	600 IU	600 IU
51-70 years	600 IU	600 IU		
70+ years	800 IU	800 IU		

*All values are from the new Nutrition Facts Label regulations.

What Food and Beverage Manufacturers Need to Know

Last year, the FDA announced new requirements for the Nutrition Facts label that appears on packaged foods. The new labeling requirements are meant to reflect new information from the scientific community, especially highlighting the link between diet and chronic diseases such as obesity and heart disease.

As part of the changes, some nutrients that were previously required to be listed on the nutrition label have been dropped. Since deficiencies in vitamins A and C have become much less prevalent recently, these nutrients no longer must be listed on the label. Iron and calcium amounts must still be included in the nutrition facts panel, and vitamin D and potassium have been added to the required list. In addition to including the percent daily value, manufacturers must now declare the actual amount of these nutrients, as well.

At the same time that the listed nutrients have changed, some of the Daily Values (DV) of various nutrients have changed as well. The DV of dietary fiber, for example, has gone from 25 grams per day to 28 grams per day. Calcium previously had a DV of 1,000 milligrams per day. The new rules raise that requirement to 1,300 milligrams per day. The DV of potassium has also gone up significantly—from 3,500 milligrams per day to 4,700.

> ***"These changes are especially significant to food manufacturers when it comes to calcium and potassium."***

These changes are especially significant to food manufacturers when it comes to calcium and potassium. With the new DV's, the amount of each nutrient in a food may remain the same but the label will different as the percentages will change. This poses a challenge for food fortification in that quantities of both calcium and potassium will have to be increased in order to keep those percentages as they are today.

Both of these minerals are challenging since they were already significant contributors to a food's makeup. In the case of potassium, the increase is made even more challenging by the fact that potassium has flavor issues—it can give a metallic or overly salty taste when used in large quantities. The challenge for those who fortify foods is to reformulate their products so that the levels of these key nutrients are significant to their overall diet, but still acceptable to the palate.

The purpose of the new label changes is to provide better information for consumers to make informed choices about the food they eat, and ultimately to help consumers make food choices that will better support their health.

The new DVs for nutrients will also be changing the public's perception of the level of a nutrient that is in food, even if that level of the nutrient remains the same. Below is an example of a specification for a premix used for a children's nutrition bar.

Let's look at calcium, for example. This premix delivers 300 mg of calcium per serving, in this case per nutrition bar. Each nutrition bar will contain 300 mg of calcium.

Nutrient	**Minimum Activity** *per 2300 mg*	**%DV**
Calcium (Dicalcium Phosphate)	300 mg	30%
Iron (Ferrous Sulfate)	3.6 mg	20%
Zinc (Zinc Oxide)	3 mg	20%
Magnesium (Dimagnesium Phosphate)	120mg	30%
Phosphorus (Dicalcium Phosphate, Dimagnesium Phosphate)	350 mg	35%
Vitamin A (Beta Carotene)	5000 IU	100%
Vitamin C (Ascorbic Acid)	60 mg	100%
Vitamin D (Cholecalciferol)	80 IU	20%
Vitamin E (d,l Alpha Tocopheryl Acetate)	30 IU	100%
Thiamin (Thiamin Mononitrate)	0.3mg	20%
Riboflavin	0.34 mg	20%
Niacin (Niacinamide)	4 mg	20%
Pantothenic Acid (d-Calcium Pantothenate)	2 mg	20%
Pyridoxine (Pyridoxine Hydrochloride)	0.4 mg	20%
Vitamin B-12 (Cyanocobalamin)	1.2 mg	20%
Folic Acid	80 mg	20%
Biotin	60 mg	20%

The old DV for calcium was 1000 mg, therefore 300 mg of calcium per serving was 30% of the old DV. The new DV for calcium is now 1,300 mg, so the same 300 mg of calcium per bar would now be reflected on the label as 23% of the DV. Due to this, a consumer's perception may be that calcium was reduced in this product, even though the formula itself did not change.

Manufacturers will need to determine if they want to reformulate their premixes to keep the percentages of the daily values constant, or to alter their labels to reflect the percentage of the new daily value, which may also impact the front-of-package claims. For example, in order to qualify for the claim "an excellent source of calcium" a product must contain at least 20% of the DV for calcium. Our example premix would still qualify for this claim with the new DVs but depending on the formulation, some products could fail to make the 20% DV claim with the new label.

Nutrition Bar with Old DV

Contains Watson Custom nutrient premix WT-5882

Nutrition Facts

Serving Size 1 bar
Servings Per Container 6

Amount Per Serving	
Calories 140	Calories from Fat 35
	% Daily Value*
Total Fat 3.5g	5%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 65mg	3%
Total Carbohydrate 14g	5%
Dietary Fiber 4g	16%
Soluble Fiber 1g	
Insoluble Fiber 2g	
Sugars 3g	
Protein 15g	

Vitamin A 100%	• Vitamin C 100%
Calcium 30%	• Iron 20%
Vitamin D 20%	• Vitamin E 100%
Thiamin 20%	• Riboflavin 20%
Niacin 20%	• Vitamin B6 20%
Folate 20%	• Vitamin B12 20%
Biotin 20%	• Pantothenic Acid 20%
Magnesium 20%	• Zinc 20%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Nutrition Bar with New DV

Contains Watson Custom nutrient premix WT-5882

Nutrition Facts

6 servings per container
Serving size **1 bar**

Amount per serving
Calories **140**

	% Daily Value*
Total Fat 3.5g	4%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 65mg	3%
Total Carbohydrate 14g	5%
Dietary Fiber 1g	4%
Insoluble Fiber 0g	
Total Sugars 3g	
Includes 3g Added Sugars	6%
Protein 15g	

Vitamin D 2mcg 10%	•	Calcium 300mg 25%
Iron 4mg 20%	•	Potassium 129mg 2%
Vitamin A 1502mcg 170%	•	Vitamin C 60mg 70%
Vitamin E 14mg 90%	•	Thiamin 0.3mg 25%
Riboflavin 0.3mg 25%	•	Niacin 4mg 25%
Vitamin B_6 0.4mg 25%	•	Folate 133mcg DFE 35%
Vitamin B_{12} 1.2mcg 50%	•	Biotin 60mcg 200%
Pantothenic Acid 2mg 40%	•	Phosphorus 581mg 45%
Magnesium 120mg 30%	•	Zinc 3mg 25%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Sources:

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