

Opportunities for ingredients of concern

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Vitamin D may be sourced naturally from mushrooms. Source: PLT Health Solutions

KANSAS CITY — Along with their prominent status in the Dietary Guidelines for Americans, vitamin D, calcium, fiber and potassium offer other promotable health benefits. Vitamin D is linked with immunity, a health trait that has risen in consumer awareness since COVID-19 struck the globe. Vitamin D and calcium also work in tandem for an osteoporosis claim. Fiber, meanwhile, can be a prime ingredient in better-for-you snacking applications, and potassium plays a role in sodium reduction.

The Dietary Guidelines for Americans 2020 listed calcium, potassium, dietary fiber and vitamin D as dietary components of public health concern for the general US population because low intakes are associated with health concerns.

Close to 90% of Americans do not consume enough vitamin D, according to the DGA. Incorporating them into food could allow manufacturers to sell them at a price premium. A study from HealthFocus International, St. Petersburg, Fla., found 31% of Americans in 2020 said they would pay up to 10% more for products that include vitamin D. While CBD (cannabidiol) was the highest ranked ingredient at 39%, vitamin D tied for second along with

probiotics, vitamin B12, collagen and antioxidants. MarketsandMarkets, Inc., Northbrook, Ill., projects the global vitamin D market to have a compound annual growth rate of 7% from 2020 to 2025, reaching a value of \$1.6 billion.

PLT Health Solutions, Morristown, NJ, and Lallemand, Inc., Montreal, both provide ingredients to increase vitamin D levels in baked foods.

An Earthlight whole vitamin D ingredient from PLT Health Solution is sourced naturally from mushrooms. A patented process exposes the mushrooms to ultraviolet (UV) light to produce vitamin D. The ingredient delivers 40,000 international units (IUs), or 1,000 micrograms, of vitamin D per gram.

Lallemand offers VitaD yeast that may be used in any product with yeast, meaning not only bread but also crackers, yeast-leavened donuts, croissants and pretzels, said Jacinthe Cote, PhD, director of LBS product management innovation and operational marketing North America. The maximum amount of VitaD yeast allowed in foods is 400 IUs, or 10 micrograms, per 100 grams, which means 200 IUs, or 5 micrograms, may be used in a 50-gram serving. That level would provide 25% of the Daily Value for vitamin D, which would allow a product to qualify for an excellent source of vitamin D since it was over 20%. A level of 10% to 19% qualifies for a good source claim.

“It’s not all the vitamin D sources that you’re able to add at such an elevated amount in baked goods,” Dr. Cote said.

The 400 IU/10 micrograms maximum amount applies to VitaD yeast since it contains vitamin D2, a vegetarian source, she said. Vitamin D3 tends to be sourced from animals.

Recent studies have linked vitamin D intake to less risk of becoming infected with COVID-19. One study involved researchers from the University of Gondar in Ethiopia who reviewed 14 studies. The pooled analysis showed individuals deficient in vitamin D were 80% more likely to acquire COVID-19 infection when compared to individuals who had sufficient vitamin D intake. The studies were conducted in Europe, the Americas and Asia. The review was published March 5 in *Frontiers in Public Health*.

Food manufacturers should stay away from making any COVID-19 claims, however.

“Today there’s definitely not enough evidence to support such a type of claim, and I don’t foresee in the coming two years that you would have the possibility to label a product with such a type of claim,” Dr. Cote said.

The US Food and Drug Administration bars companies from saying a food, beverage or dietary supplement may treat, cure or mitigate any illness because that would imply it was a drug.

“That being said, there have been a great many research articles published in the last year with an astounding amount of agreement that we should all be getting our vitamin D right now,” said Jeremy Appleton, ND, director of medical and scientific affairs for PLT Health Solutions. “The best supported structure-function claims one legitimately can make about vitamin D supplementation are that it is required for bone strength and immune health, and that deficiency is common and problematic. The medical literature is overflowing with randomized, controlled clinical trials demonstrating the efficacy of vitamin D supplementation. Earthlight is vitamin D, so those claims apply.”

More than 40% of consumers, after the pandemic began, said they were buying food and beverage products to protect their immune systems, according to information released in June by Packaged Facts, Rockville, Md., which added the US market for foods and beverages with claims for gut health or immunity increased by more than 50% in 2020 to reach \$59 billion.

Avoid Chalky Mouthfeel in Calcium

The FDA allows the claim “adequate calcium and vitamin D throughout life, as part of a well-balanced diet, may reduce the risk of osteoporosis.”

Close to 30% of men and 60% of women older than age 19 do not consume enough calcium, according to the DGA. Lesaffre cites data from the National Health and Nutrition Examination Survey showing males of the ages 9 to 13 and over 70 and females of the ages 9 to 18 and over 50 do not consume enough calcium. Lesaffre offers SafPro Accent fortification products that add calcium to sandwich bread, sub rolls, hamburger and hot dog buns, bagels, pita bread and flat bread. Other potential applications include cookies, muffins, snack cakes, pasta, cereal and crackers.

“Most common calcium sources for baked goods fortification are calcium sulfate and calcium carbonate,” said Mary Thomas, senior R&D manager bakery for Lesaffre. “Both can give baked goods a chalky, gritty texture. SafPro Accent calcium fortification is a patented blend of calcium carbonate and citric acid. In yeast leavened systems, it is important to maintain proper pH during the fermentation process. SafPro Accent calcium fortification blends contain citric acid which maintains proper pH for good fermentation and dough development. The specific granulation of calcium carbonate reduces the chalky mouthfeel.”

Calcium levels of 25% in two slices whole grain packaged bread and 20% in one tortilla may be achieved, according to Lesaffre

Fiber for Healthy Snacking

More than 90% of women and 97% of men do not meet recommended intakes for dietary fiber, according to the DGA. Getting more fiber into applications could appeal to consumers seeking healthier snacks. Research from The Hartman Group, Bellevue, Wash., showed 70% of consumers said on average they snack each day and 60% said at least weekly they seek

snacks they consider healthy and nutritious, meaning those with low fat, less sugar, high in protein and high in fiber, said Sarah Diedrich, marketing director, sweetening solutions and fibers at Chicago-based ADM.

“Snack brands should take this into consideration as new product development is in the works,” she said. “We anticipate crunchy multigrain crackers, salty puffed pea crisps, bean chips, chewy bars and crispy cookies packed with fiber, protein, wholesome ingredients and low in sugar to capture shoppers’ attention and repeatedly make their way into carts.”

ADM/Matsutani LLC, a joint venture between ADM, Matsutani Chemical Industry Co. Ltd. and Matsutani America, Inc., offers Fibersol ingredients.

“Fibersol works particularly well in baked goods and crunchy snacks like cookies, crackers, flatbreads, biscuits, bars and snack mixes, as it is water-soluble, process stable, and has low viscosity,” Ms. Diedrich said. “It’s also heat- and acid-stable, which is key in harsh baking conditions. Plus, Fibersol helps formulators minimize the need for flavor maskers and mouthfeel enhancers as it maintains desired texture and is neutral in taste and color. This helps to ensure a delicious baked offering every time.”

Fibersol helps with bulking and binding that can be lost when sugar is reduced, she added.

“Fibersol can be used by bakers in a similar way as standard sugar, syrups or honeys, such as mixing it with butter or oil to achieve a crispy cookie,” Ms. Diedrich said. “Fibersol helps build back structural integrity in baked goods with 30% to 50% sugar reduction targets.”

Nearly 70% of consumers said they would not purchase a product again if it caused gastrointestinal discomfort, according to ADM’s Outside Voice research. Fibersol, a prebiotic, supports digestion, promoting the growth of beneficial microbes in the gut, Diedrich said. It may be well tolerated up to 68 grams per day.

More potassium, Less Sodium

The FDA in October issued voluntary short-term reduction sodium targets for 163 packaged and prepared foods. The goal is to reduce average sodium intake to 3,000 mg per person per day from the current average of 3,400 mg over the next 2.5 years. The DGA recommends 2,300 mg or less per person per day.

Potassium salt, also known as potassium chloride, plays a role in reducing sodium in that it mirrors sodium chloride’s functional attributes. Potassium salt has been shown to help control yeast fermentation, aid in gluten formulation, help control microbial growth, extend shelf life, and contribute to flavor, texture and color, said Janice Johnson, PhD, food science adviser for Cargill, Minneapolis.

“The only downside: at higher levels, potassium salt may impart bitter or metallic notes,” she said. “To compensate, bakers may need to adjust a product’s flavor profile or look at ways to generate more flavor through minor adjustments in processing. Extending fermentation time, for example, is one way to produce more flavor compounds.”

The blander a baked food is, the harder it is to increase potassium salt levels and decrease sodium chloride levels.

“With a standard white bread, there are few other flavors to hide any bitter or metallic notes associated with potassium salt,” she said. “However, a whole wheat bread already has some bitter notes coming from the wheat bran. As a result, you can push potassium salt inclusion a little higher and the bitter/metallic taste won’t be as noticeable. Consumers know to expect some bitterness from whole wheat breads.”

Milling whole grains may cause the removal of nutritious components such as fiber, vitamins and minerals, including potassium, Dr. Johnson said.

“Fortification of white flour (enriched) will replace some of the vitamins and minerals lost during milling, but potassium is generally not one of them,” she said. “Therefore, food products made with white flour will generally have less potassium than products made with whole grains, unless there are other ingredients in the formula that contain potassium.”

Products may qualify for a claim of excellent source of potassium if they have 20% or more of the Daily Reference Value per RACC (reference amount customarily consumed) serving. A level of 10% to 19% would qualify for a good source claim.

“Products like cookies, snack cakes and bars can all be good candidates for potassium salt,” Dr. Johnson said. “These formulas include lots of sugar and other flavors that can help manage any bitter/metallic notes that might come with the addition of potassium salt. In general, bakery and snack items with more flavor complexity can help manage off notes, enabling higher inclusion levels of potassium salt.”

Cargill offers Potassium Pro Ultra Fine Potassium Chloride as an option for seasoning mixes or partial replacement for salt in topical applications. Its micro-sized particles help mitigate some of the bitter/metallic notes typically associated with potassium chloride, enabling higher levels of sodium replacement. The larger particle sized Potassium Pro Potassium Chloride works well when added to food applications, where it dissolves and distributes evenly.

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