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# Functional Food & Beverage Formulation Solutions



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**Viewpoint: Putting the Function in Food, Beverages** 



#### **Functional Sweetness Beyond Sugar**

Research has yielded vast improvements in stevia, **Cindy Hazen** notes, and with additional options such as sugar alcohols, malitol, agave, prebiotic fibers, monk fruit and more, formulators are finding the right alternative sweeteners for a wide range of applications.



#### **Products as Flavorful as They Are Functional** Consumer demand is on the rise for foods and beverages that taste great and provide health benefits. **Ginger Schlueter** details the potential problems and solutions formulators face in creating top-notch functional products.



#### **Challenges to Delivering Tasty, Healthy Products**

From challenges in mouthfeel and texture to shelf life, consultant **Marie Spano**, R.D., explains how properly masking the flavor of plant proteins, functional ingredients and sugar substitutes is big business.



#### Functional Foods & Beverages: A Purpose-Driven Trend

Data from the Natural Marketing Institute (NMI) indicates more consumers—particularly Millennials—are looking to foods for functional benefits. NMI's **Steve French** shares the specifics.



**Takeaways: The Future of Functional Food & Beverages** 

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### **Putting the Function in Food, Beverages**

While the importance of functional foods is strong among

all consumers, key generational differences provide insight regarding growth opportunities and targeting. Millennials represent the largest population of consumers—88 percent—who believe consuming functional food is important to a healthy lifestyle,



followed by Gen Xers (42 percent) and Baby Boomers (36 percent), according to data from the Natural Marketing Institute's (NMI) 2017 Health & Wellness Trends Database.

This data rings true, especially for my multigenerational household with varied nutritional and lifestyle demands. For example, my 82-year-old mother is an eight-year breast cancer survivor who keeps our crazy household in order. She is fit, yet turns to nutritional shakes loaded with protein, fiber and calcium to help maintain bone health and provide her with an afternoon pick-me-up to haul my 10-year-old daughter to tennis and softball practices. My husband and I—both Gen Xers who are active and adhere to somewhat healthy diets—also turn to functional foods and beverages to help with muscle recovery, sports endurance and immunity. Sadly, I have incorporated more functional products to address the dark side of dreaded menopause to help with sleep and hot flashes.

We are in line with the three-quarters of American adults who want to be in control of our health and believe consuming a healthy, nutritious diet is important to maintaining a healthy lifestyle. By choosing foods and beverages that "work" for them, consumers are proactively managing specific health issues and medical conditions. Since 2009, a twofold increase of consumers believe consuming functional or fortified foods is important in maintaining their health, NMI noted.

Consumers have become resolute in making purposeful choices; however, they don't want to sacrifice taste for function—especially in reduced-sugar products. Product developers also must be mindful of how functional ingredients interact in the formulation process. For example, certain plant proteins can leave off-notes, while certain botanicals and inclusions might affect mouthfeel. This Digital Magazine addresses several key components to the development and manufacture of functional foods and beverages, including clean label sweetener options and formulation solutions that address mouthfeel and flavor-masking challenges that can arise in functional foods and beverages.





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## **Functional Sweetness Beyond Sugar**

by Cindy Hazen

#### **INSIDER's Take**

- More than half of consumers surveyed are trying to avoid or limit sugar intake—even more said product taste has the most impact on their decision to buy a food or beverage.
- Stevia technology has come a long way since it was first introduced as a commercial ingredient, as formulators continue tinkering with and customizing the different glycosides found in its leaves.
- Sugar alcohols pair well with other sweeteners and can help fill the gaps of flavor and functionality, while plant-based sweeteners are a clean label solution that minimizes undesired taste attributes.

#### Most people who use a computer program are unaware of the effort that went

into its creation. Behind the scenes, thousands of lines of code come together, put in place by a patient programmer who tweaked until all the bugs were out.

The same is true for food development. Unless one has worked on the research and development (R&D) bench, it's hard to imagine the number of starts, stops and retests to get just the right balance of flavor. The challenge is more complex when working with sweeteners.

Consumers are increasingly seeking healthier food and beverage choices, including reduced sugar for weight and blood glucose management. Beginning January 2020, FDA will require a new format of the Nutrition Facts panel that requires clearer callouts for calories, servings and added sugars. The clean label movement limits the ingredients consumers will accept in their foods; however, since "natural" has no common definition, developers must employ a bit of wizardry to understand exactly what drives consumers.

#### **Opinions Matter**

"Consumer tastes are evolving, and concern around calories and nutrition continues," said Matt Drew, director, strategic marketing, at ADM. "Yet, people aren't willing to compromise on taste—making it more challenging to meet taste, nutrition, labeling and cost parameters."

Recently, ADM conducted research through its proprietary platform. "We found that sugar and sweetener preferences vary by cohort and geographic region," Drew said.

To gain greater insights into consumers' understanding of clean label issues, Cargill conducted proprietary research. "Among our findings, nearly 60 percent of respondents say they are aware of 'clean label' products, but far fewer have a deep understanding of what the term means," said Pam Stauffer, global marketing programs manager at Cargill. "Not that it matters; nearly eight in 10 say they are at least somewhat likely to seek out these products."

More than half of respondents said they analyze a product for its nutrition facts, front-ofpackage nutrition summary, ingredients and claims on the front of the package. However, the tendency to check an ingredient list is more often driven by the desire to avoid an

IN THIS ISSUE Viewpoint p.3 Flavor-Masking Ingredients p.14 Table of Contents p.2



**Consumers** are increasingly seeking **healthier food** and **beverage choices**, including reduced sugar for weight and blood glucose management. ingredient than to seek one out. "This pattern is true across all demographic groups and was especially high among those seeking to reduce sugar," Stauffer continued.

Data from the International Food Information Council (IFIC) Foundation's 2017 Food & Health Survey revealed more than three in four Americans reported they are trying to avoid or limit their sugar intake. That same survey found six in 10 respondents view added sugars negatively.

"We see that trend reflected in the new sugar and sweetener product launches reported by Innova Market Insights," Stauffer commented. "In 2016, the market research firm found nearly 40 percent of sugar and sweetener product launches included lowcalorie claims, up 21 percent from 2012. It also noted that clean label remains a key platform in sugar and sweetener innovation, with over 60 percent of category product launches between 2012 and 2016 featuring clean label claims like no additives/ preservatives, organic, genetically modified organism (GMO)-free and natural."

This leaves food developers with a conundrum. The 2017 IFIC study showed more than 84 percent of U.S. consumers consistently said that product taste has the most impact on their decision to buy a food or beverage. If they want the same taste that sugar provides, but they want less added sugar and no artificial ingredients, food scientists have fewer ingredients to work with. Fortunately, the field is evolving with cleaner-tasting, next-generation sweeteners. Understanding of how to blend sweeteners to achieve optimum synergy and flavor is growing daily. And there are several consumer-friendly sweeteners to choose from.

#### **Stevia's Simple Solution**

Stevia's sweet complexity comes from the glycosides found in the leaves of the *Stevia rebaudiana* plant. Flavor can vary with the combination of glycosides extracted, the method of extraction, the plant variety and the growing conditions. The path to the ideal combination has been challenging, but rewarding.

"With the early reb A (rebaudioside A) stevia sweeteners, developers were focused on managing aftertastes, such as bitterness, metallic or licorice notes," Stauffer said. "Given the huge leap forward in quality of sweetness, today's next-generation stevia products give developers more versatility in their quest to create greattasting, reduced-sugar beverages. However, in the final stage of development, especially with deeper sugar reductions, it may be necessary to leverage natural flavors, such as sweetness enhancers or modulators. These types of flavors can enhance upfront sweetness or round out the sweetness profile, delivering a closer dynamic to the full-sugar beverage."

Faith Son, vice president, marketing and innovation at PureCircle, agreed stevia has come a long way since it was first introduced as a commercial ingredient in the late 2000s. The challenge in working with conventional stevia leaf varieties, she said, can be attributed to mouthfeel because the stevia leaf lacks certain bulking properties that exist in sugar.

At the same time, stevia can offer more than just sweetness, especially in functional food and beverages. "Vitamins and minerals are typically bitter," Son said. "Our research has been able to identify the select extracts from the stevia leaf to help mitigate some of the bitterness from functional ingredients."



Using crossbreeding techniques, PureCircle has developed a stevia variety that yields more than 20 times the most sugar-like content compared to conventional stevia leaf varieties, which were commercialized 10 years ago. She pointed to another development coming from the stevia leaf—the discovery of flavor modifiers occurring naturally in the leaf, which can enhance key benefits such as mouthfeel, sweetness quality and different tonalities across a wide range of products and applications.

Cargill offers several stevia options beginning with a traditional high-purity reb A stevia product. In beverages, these extracts can be used to replace up to 30 percent of the sugar; however, as sugar reduction goals increase, these stevia leaf extracts will eventually bring inherent bitterness or stevia aftertaste.

> The company has a portfolio centered on a proprietary tasteprediction model that can predict which combination of steviol glycosides will deliver optimal taste and sweetness. Up to 70 percent sugar reduction is obtainable.

Another option is based on the glycosides reb M and reb D, which offer heightened sweetness and a taste closer to real sugar. "While these glycosides are rare in the stevia plant, we can produce them more sustainably through fermentation," Stauffer said. The resulting product—EverSweet<sup>™</sup>—will be commercially available later in 2018 and provides sweetness without bitterness or a licorice aftertaste,

creating a rounded taste profile with a fast onset of sweetness. "It is ideal for manufacturers looking for deep calorie reductions, enabling up to 100 percent sugar replacement," she said.

The challenge in working with conventional stevia leaf varieties can be attributed to mouthfeel because the stevia leaf lacks certain bulking properties that exist in sugar. When formulating with stevia in beverages, Cargill's team recommends a layered approach. First, lay the foundation using stevia sweeteners, targeting concentrations to deliver sweetness slightly below and above the sweetness gap. Using a bracketed approach to help gauge sweetness intensity against a full-sugar beverage provides insights into key effects on flavor attributes. The team found that slight shifts in the concentration of stevia sweeteners, just 10 parts-per-million (ppm), can have a dramatic impact on sweetness perception and flavor profile.

Robert Verdi, vice president, business development at Virginia Dare, said flavor profiles with some inherent bitterness tend to work better with stevia. As an example, he said, "dark chocolate works well with stevia, but if the customer desires a sweet chocolate profile like a sweet milk chocolate, it is more challenging, and there will be greater demands on the masking flavor."

#### **Polyols and Other Options**

Polyols, or sugar alcohols, are polyhydric alcohols produced by hydrogenation or fermentation of different carbohydrates. Chemically, polyols are derived from mono- and disaccharides. They pair well with other sweeteners and can help fill the gaps of flavor and functionality.

**Erythritol** is a zero-calorie bulk sweetener that looks and tastes like sugar. It has a high digestive tolerance and can help mask the aftertaste of high-intensity sweeteners. It doesn't caramelize or participate in the Maillard reaction, so there are challenges when using it in baked goods. Thom King, president at Icon Foods, suggested using erythritol in bars, beverages and powders. "Since we can produce this in any mesh down to 220, which is finer than confectionery sugar, it makes it very useful in fillings, frosting and fondants. Also notable is its ability to drive down freezing-point depression in frozen desserts."

In ice cream, sugar is what lowers the freezing point and prevents the formation of large ice crystals, creating that smooth, silky texture expected in a premium ice cream. "In reduced-sugar applications, erythritol can fill that void," said Ravi Nana, polyols technical service manager at Cargill. "Because of its small molecular size (one-third that of sugar), erythritol provides a threefold freezing-point depression factor. That higher effect on freezing-point depression helps soften reduced-sugar ice creams, creating the scoopable texture consumers crave. It can also help replace sugar's bulk, replacing sugar at a 1:1 ratio. Using a combination of erythritol and stevia, product developers can achieve a 25 to 30 percent reduction in sugar. That's enough to make a reduced-sugar label claim, yet still deliver a frozen dairy dessert that consumers will rave about. Deeper reductions are possible; the key is landing on the right sweetener blend."

When used as a flavor in beverages, erythritol reduces the off-tastes of high-intensity sweeteners. In addition to its flavor-modifying attributes, as a bulk sweetener, erythritol helps enhance the body and mouthfeel of reduced-sugar beverages.



Erythritol pairs well with stevia sweeteners. "It limits the off-tastes, rounding out the sweetness profile and reducing sour, bitter and chemical taste attributes," said Wade Schmelzer, principal scientist at Cargill. "At a maximum inclusion level of 1.25 percent, erythritol may be labeled as a 'natural flavor' in the ingredient deck."

Due to its natural status, erythritol is the most common sugar alcohol paired with stevia. "We don't see the natural sweeteners stevia or monk fruit paired with polyols that are not considered natural," Verdi said. "Erythritol does contribute some sweetness (about 70 percent as sweet as sucrose), so when using erythritol, you can formulate with lower levels of stevia—avoiding the off-notes of stevia experienced at high-use levels."

**Maltitol** is a generic name for a wide range of products mainly consisting of the pure substance "maltitol," but which may include sorbitol and hydrogenated oligosaccharides in various concentrations. It is made by chemical hydrogenation of maltose and is commercially available as a crystalline powder of syrup ranging from 50 to 97 percent maltitol purity on a dry base, with less than 8 percent sorbitol.

Crystalline maltitol is about 85 to 90 percent as sweet as sucrose. It can be used as a 1:1 replacement for sugars in sugar-free, no-sugar-added or reduced-sugar chocolate coating, bakery and chewing gum coating applications.

Maltitol syrup with low maltitol content is the only polyol that can be used at higher levels in sugar-free gummies without crystallization. It is also used in combination with isomalt in sugar-free hard candies to boost the sweetness and overall taste profile.

According to Nana, in addition to giving sweetness, viscosity and solids in frozen desserts like ice cream, maltitol provides freezing-point depression functionality. Maltitol syrup also provides crystallization control in applications like no-sugar-added caramel.

"In the United States, crystalline maltitol is considered to have 2.1 kcal/g, and maltitol syrup (depending on maltitol content) has about 3.0 kcal/g," Nana said. "So, it has 25 percent fewer calories than sucrose. Like other polyols, it is tooth-friendly. It has relatively more digestive tolerance than other sugar alcohols, with the exception of erythritol. Product developers need to take into consideration the serving size and dose amounts when formulating with sugar alcohols."

Creating the optimum system often requires a multifaceted approach that extends beyond taste. Hydrocolloids help build back the oral viscosity and mouth coating that is typically lost when switching to a high-intensity sweetener from sugar. "This allows the consumer to have a sensory experience that is much closer to the standard full-sugar product," said Lauren Schleicher, food scientist at TIC Gums. Besides affecting texture, gums can alter flavor perception. A thick and creamy salad dressing is an example. Since

ERYTHRITOL

it will linger on the tongue longer than a thin one, its taste will be more fully experienced by the consumer.

Chicory root fiber, also known as inulin, contains chains of oligofructose or fructooligosaccharides (FOS). These chains of oligo- and polysaccharides can be short or long. They are nondigestible in the small intestine, and fully fermentable in the large intestine. They are considered fibers with prebiotic properties, so they are beneficial to gut health and offer practical benefits to the food developer. King noted that FOS provides mouthfeel and is also an excellent fat emulator.

Bill Gilbert, certified master baker, principal food technologist at Cargill, suggested chicory root fiber can aid in sugar reduction. "It provides key functional properties, including helping to modulate the flavor of some highintensity sweeteners and acting as a bulking agent when removing sugar from a formulation. Together, these three ingredients can be used to reduce sugar in a wide range of snack and bakery products."

#### Trehalose, Allulose, Fructose Add Versatility

Sometimes, a product developer needs an ingredient that will multitask. **Trehalose** is a carbohydrate that can minimize the flavor off-notes and odors that accompany many of the functional ingredients found in today's wellness-focused foods and beverages. At the same time, trehalose also brings out the distinctive top notes in trendy fresh vegetable and fruit drinks, all while serving as a flavor stabilizer, protecting flavor quality during processing and throughout a product's shelf life.

"For example, trehalose helps re-create a fresh-squeezed taste in lemonade with an extended shelf life," said Vince Cavallini, beverages, snacks and cereals application manager at Cargill. "A little bit of trehalose enhances the citrus notes inherent in the beverage, resulting in a fresher-tasting beverage, even after eight weeks on the shelf. Processing and storage conditions can also do a number on a product's taste. Extreme processing temperatures, pH levels (especially with high-acid drinks), oxidation and storage conditions can all affect flavor. To protect flavor quality, a flavor stabilizer like trehalose can help."

Even at low-use levels, trehalose can cover off-notes from high-intensity sweeteners. Cavallini pointed out that trehalose can be used in natural flavor systems, helping to deliver on label simplification goals.

**Allulose** can be found in trace amounts in figs, raisins and tomatoes. It's an isomer of fructose with the same molecular formula as fructose and glucose; however, it is not metabolized. Considered GRAS (generally recognized as safe) by FDA, allulose may be used as a sole source of sweetness or in combination with other sweeteners. Allulose exhibits a synergistic effect with other sweeteners, so optimal flavor development and cost benefits are realized when formulating reduced-, low- or no-calorie foods and beverages.

FDA allows use of allulose in a wide range of food products including: carbonated and noncarbonated beverages; baked goods such as frostings, cakes, pies, pastries, biscuits and rolls; frozen dairy desserts; jams and jellies; sweet sauces; syrups; chewing gum; hard and soft candies; and puddings and fillings.

Icon Foods carries a sweetening blend of allulose, stevia and monk fruit. King recommended using this product as a 1:1 replacement for sucrose with a 90 percent clean label sugar reduction. It's neutral in flavor, so it can be used in nearly every application. As an added benefit, it participates in the browning of baked goods.

Fructose is commonly combined with high-intensity sweeteners to add bulk and functionality in foods and baked goods. It's the most water-soluble of all the sugars. Consumers recognize it as fruit sugar. It's twice as sweet as sucrose and sweeter than high fructose corn syrup (HFCS), and it has a lower glycemic load than either sweetener.



In general, high-intensity sweeteners, either artificial or natural, have a characteristic lingering effect different from sugar.

While Icon Foods offers non-GMO fructose, the company is putting more focus on the blend of allulose, stevia and monk fruit—because in addition to providing for deep, clean label sugar reduction, it also provides functionality in baked goods.

#### **Fruit-Based Sweeteners**

Plant-based sweetening is the ultimate clean label solution. **Agave** nectar (also called syrup) is produced from blue agave, a succulent native to the American Southwest and Mexico. Agave's flavor has been compared to honey, although its profile is much lighter. King described the flavor as relatively neutral. "It plays well with high-intensity sweeteners, such as stevia and monk fruit," he said. Plus, it contributes to mouthfeel, he continued, "primarily because of the amounts of inulin that naturally exist in agave. In the agave nectar, there exists about 3 percent inulin, a multichain fructooligosaccharide."

**Monk fruit** is a high-intensity sweetener derived from the fruit of *Siraitia grosvenorii*. It's up to 200 times as sweet as sucrose. Sweetness is derived from a group of glycosides called mogrosides that are extracted from the pulp of the fruit.



AGAVE

**MONK FRUIT** 

Monk fruit has after-notes reminiscent of melon rind, so he recommended combining it in systems with warmer flavors, such as caramel and vanilla. "We've also had a great deal of success with citrus flavor profiles," he said. "On its own, [monk fruit] has challenges in neutral flavors, but this can be mitigated quite easily with allulose, inulin or erythritol. Also, adding a small amount of stevia can mask the off-note monk fruit can impart."

In general, high-intensity sweeteners, either artificial or natural, have a characteristic lingering effect different from sugar. "The combination of high-intensity sweeteners with low-intensity sweeteners can help, as well as utilizing masking, mouthfeel and sweet-modulation technologies," said Renata Ibarra, senior R&D director, taste, at Kerry Ingredients and Flavors.

Compared to stevia, Verdi said monk fruit can deliver a cleaner sweetness profile. He recommended incorporating monk fruit into blends with stevia to reduce the use level of stevia. "Stevia can deliver acceptable sweetness quality at low levels of sweetness," he said. "When the sweetness level is pushed too high with stevia, the off-notes become more noticeable and unacceptable. Higher levels of acceptable sweetness can be achieved with stevia and monk fruit blends. Based on feedback from our customers, the cost in use of monk fruit is relatively high at the moment, which limits the amount our customers are willing to use. Blends of sweetners tend to minimize the shortcomings of any single sweetners. Stevia can be used in blends to lower its contribution to the overall sweetness, and is also fairly cost-effective. Monk fruit can be utilized in blends with more cost-effective sweeteners to contribute an acceptable sweetness profile while managing raw material costs."

Mukul Juneja, vice president, marketing for WILD Flavors & Specialty Ingredients, ADM, said it's important to use caution when working with any sweetener including monk fruit. "Our flavorists pay close attention to the overall sweetness profile," he said. "Any flavor type can be rebalanced to work in harmony with monk fruit to deliver the right upfront, middle and end sweetness intensity, and a rich flavor impression."

ADM has a large portfolio of natural plant-based extracts and distillates that can be helpful in minimizing any undesired taste attributes without introducing any new characterizing flavor. Fruit Up<sup>™</sup> is an innovative ingredient from ADM that delivers natural sweetness from fruit. Juneja calls it an ideal solution for a new generation of deliciously sweet, clean and clear label foods and drinks. With its low glycemic index, it is also a perfect solution for slow energy-release foods and beverages seeking to provide longer-lasting energy. Fruit Up works well in conjunction with other sweetening ingredients and can be used in any food or beverage application that can use liquid syrup.

The final solution for clean label sugar reduction may be just as simple. "Less complex applications for the use of either stevia, erythritol or monk fruit are the ones that already contain a source of sweetness either derived from sugar, agave or some fruit juice," Ibarra concluded.



Cindy Hazen has more than 25 years of experience in developing seasonings, dry blends, beverages and more. Today, when not writing or consulting, she expands her knowledge of food safety as a food-safety officer for a Memphis-based produce distributor. She can be reached at <u>cindyhazen.com</u>.

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Sugar Reduction

# **Beyond the label, they'll never guess there's less.**

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### **Products as Flavorful as They Are Functional**

by Ginger Schlueter

#### **INSIDER's Take**

 Consumers demand foods and beverages that taste great and provide health benefits, even if ingredients that produce off-notes are used.  Flavor-masking ingredients and techniques can create great-tasting functional foods and beverages with clean label ingredients.  No one magical ingredient or process masks all off-notes; flavor masking is an art of complementing off-notes or distracting taste buds.

#### In frantically paced modern, global societies, consumers are increasingly on the

lookout for convenient, clean label, functional foods and beverages that deliver health benefits without sacrificing flavor. This challenges product developers to carefully choose targeted ingredients for their formulations and consider flavor-masking ingredients and technologies, as some functional ingredients present off-notes and bitter, beany, earthy, cooked, astringent, etc., flavors that are not palatable to consumers. With the global functional foods and beverages market predicted to grow from about US\$300 billion in revenue in 2017 to over \$440 billion in revenue in 2022, according to Statista, there is no time like the present for product developers and formulators to become familiar with common formulation challenges and solutions available through flavor-masking ingredients and processing techniques.

#### **Consumer Preferences**

From mass market grocery stores to convenience stores and local mom-and-pop shops, functional food and beverage products are readily available, as consumer interest and demand drives retail outlets to offer such products. "Thanks to the proliferation of functional products, consumers can pick and choose foods and beverages that fulfill their individual needs," said Holly McHugh, marketing associate, Imbibe.

Part of the "picking and choosing" process revolves around product packaging. Consumers are increasingly taking the time to read and study labels, seeking "familiar ingredients that have a clear purpose and looking for ingredients that are recognizable and that they can feel good about," shared Sudarshan Nadathur, chief dairy flavorist, ADM. They are also searching for key words such as "non-GMO" (genetically modified organism), "natural" and "organic" on product packaging, which can increase the likelihood of product purchase.

In addition to functional ingredients, consumers seek products to complement their active lifestyles while offering a range of benefits—increased energy, digestive health, support of cognitive function, heart health and more. For example, as "consumers are balancing work and family demands, they seek energy through beverages, shots, gels, supplements and even energy gummies," said Bob Verdi,

IN THIS ISSUE Sweeteners p.5

Formulation p.20

Table of Contents p.2

vice president, business development, Virginia Dare, noting there is also high demand for alternative protein sources. "Consumers, particularly Millennials, perceive plant proteins as healthier and more sustainable than animal-based protein," he continued.

Each of these components factor into the purchasing decision. Overall, consumers expect functional products to "provide convenience, portability, variety and great taste," stated Mel Mann, director flavor innovation, Wixon Inc. Making products easy to consume and great-tasting is the first hurdle to ensuring functional food and beverage formulation success, hence, providing consumers with desired health benefits.

#### **Functional Ingredient Challenges, Solutions**

When formulating functional foods and beverages, specific ingredients—such as protein, vitamins, minerals and natural extracts—are used to fulfill high consumer demand for products that provide functionality as well as great taste. The challenge comes from better-for-you ingredients that produce off-notes in finished products, compromising taste.

According to Mann, any ingredient can present taste or flavor challenges. Nadathur added the type and intensity of off-taste can vary, depending on the amount of ingredients used and the application. Therefore, recognizing commonly used functional ingredients that cause taste issues is key during formulation of products.

Consumers demand protein, but depending on protein type, Mann said bitterness, astringency and sometimes sourness can result. Blake Wester, senior applications scientist, beverage, Flavorchem Corp., concurred, adding "many vegan proteins can have a rather unpleasant flavor, and the grittiness of some can be very difficult to compensate for." Verdi noted plant-based proteins may require "masking flavors to improve consumer acceptability."



The challenge comes from better-for-you ingredients that produce off-notes in finished products, compromising taste.

Certain vitamins, minerals and botanicals are known to affect flavors in challenging ways. "High levels of B vitamins, some amino acids and certain minerals will add a sour, bitter or metallic taste (to finished products)," Mann said, adding that less-refined versions of purified botanical extracts can taste earthy, green or bitter.

High-intensity sweeteners such as stevia and energy-delivering ingredients such as caffeine, taurine or guarana also pose a taste challenge with bitterness often resulting. Additionally, Mann said using complex molecules such as antioxidants at functional levels usually produces off-notes simply due to the presence of such compounds.



To mitigate these challenges, consider using various flavormasking ingredients that either work at the receptor level to prevent certain taste compounds from binding to taste receptors on the tongue or counter basic tastes. As an example, Mann explained astringency is a result of proteins precipitating onto the surface of the tongue and "fouling" the taste receptors. "One approach is to preferentially bind an ingredient to the receptors, so they don't perceive the protein precipitate," he said. An example of countering tastes can be explained with bitterness. It "can be offset by the addition of sweet-tasting ingredients, while other components may block certain taste sensations," said Marie Wright, vice president and chief global flavorist, ADM.

Although no magical ingredient makes off-notes go away, "the art of the developer lies in using flavors that complement the offnotes or work to distract the taste buds," Wester said. As an example,

one can use a grapefruit flavor where bitterness is already expected. Also bitter are branched chain amino acids (BCAAs), but "with the use of flavorings, sweetness and acid levels, bitterness can be limited to an acceptable level," said Rachel Dannemeyer, nutrition application technologist, Synergy Flavors.

To help ensure flawless use of ingredients with no off-tastes, look at the food or beverage holistically up-front, as opposed to trying to incorporate masking ingredients once the formulation is complete.

#### **Processing Technique Challenges, Solutions**

Handling functional and flavor-masking ingredients through distribution, blending, processing and packaging is critical to reducing off-notes in the finished product. Mann suggested planning ahead to determine limits on exposure to temperature, oxygen, light and any other environmental factors that can degrade taste and nutritional value. "It's also important for product developers to consider what processing method is required before starting a project in order to incorporate ingredients that can combat off-notes in the formula," advised Justin Kozlowski, director of flavor operations, Imbibe.

Kozlowski noted bitter flavors also can be produced as a result of the Maillard reaction, the chemical reaction that occurs between sugars and proteins when certain foods, such as meat and bread, are cooked at high temperatures. "Rapid heating and rapid cooling may be used where a cooking step is required to limit nutrient and flavor degradation," Mann said. Aseptic processing is another consideration, as it is a "gentler process that exposes the product to heat for a very short period of time," Wester said.



Gaining in popularity is high pressure processing (HPP) to "provide food-safety requirements and deliver shelf life of perishable foods with the benefit of reduced negative impact on flavor," Mann stated. Yet, Wester noted refrigeration is still required, as HPP alone does not destroy all bacteria.

Akin to pasteurization, ultra-high temperature (UHT) processing is often used to sterilize finished products and package into pre-sterilized containers in a sterile environment. Although UHT processing "can impart off-notes or cooked notes, and move away from the desired fresh character of food," Kozlowski said off-notes usually tend to dissipate when working with beverages. "UHT-processed beverages with a high pH (for example) that contain dairy or whey proteins might have an off-note for the first three weeks after processing," he said.



Products high in protein, plant-based ingredients, nutraceuticals, vitamins and natural sweeteners present challenges to creating consumerfriendly clean label products.

After those three weeks, however, off-notes become difficult to detect. In terms of pH levels, Nadathur added that product pH is a concern and can affect overall taste, accentuating bitterness and astringency in low pH products.

#### **Technically Speaking**

The use of flavor-masking ingredients and processing techniques is a layered process. While one could be sufficient without the other, working in tandem, the choice of flavor-masking ingredient(s) and other necessary functional ingredients determines the processing technique—just as the processing technique is based on the choice of ingredients. Therefore, it's not a case of which ingredient or technique is best. The determination is based on achieving desired results with the finished product.

"Creating products that consumers love requires active collaboration," Nadathur said. Therefore, product developers considering the use of flavor-making ingredients and techniques should start a discussion with various masking companies to determine what solutions best meet their needs. Suggested questions to ask include:

- Does the company have sensory data to back up the "masking" claims it is making?
- How can it add value beyond simply supplying ingredients and flavors?
- How long has it been selling masking flavors and how extensive is its portfolio?
- How will the ingredient(s) be listed on the label?
- Can it use a product sample base to apply its ingredients to evaluate performance?

Flavor-Masking Ingredients

It is equally important to make sure masking companies "know and understand what type of claims product developers will be using, such as the 'natural, non-GMO or organic,' or are they open to using artificial sweeteners," Dannemeyer mentioned. "Knowledge is the key to effective suggestions."

#### **The Future of Flavor Masking**

As clean label continues to resonate with consumers who want products that contain ingredients found in their pantries (or are at least familiar-sounding), flavor-masking ingredients must follow suit. "Any additive to mask off-tastes needs to be label-friendly," Nadathur said, noting added natural solutions—extracts, distillates and ingredients derived from nature—are trending, as these are known ingredients and can provide clean label verbiage to packaging.

Parallel to clean label is the "continued drive to eliminate ingredients that consumers believe are bad for them," Mann said, identifying maltodextrin, propylene glycol and chemical-sounding names as examples.

Consumers will continue to expect functional food and beverage products to taste great, even as more novel and exotic ingredients are used to create new flavors and benefits. Therefore, "the demand for taste modification will continue as needed to match good taste with healthy lifestyle," Mann said.

Keep in mind that products high in protein, plant-based ingredients, nutraceuticals, vitamins and natural sweeteners present challenges to creating consumer-friendly clean label products. This means flavor-masking ingredients and processing techniques will continue to be important to creating great-tasting products that also support consumer health.

"As ingredient processing continues to evolve, cleaner-tasting ingredients will become more in demand, with the industry responding with the creation of new processes and techniques," Dannemeyer said.

Each product formula is unique, requiring careful evaluation to determine exactly which flavor-masking ingredients should be used, along with the appropriate processing technique. This makes partnering with knowledgeable suppliers of utmost importance.

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## **Challenges to Delivering Tasty, Healthy Products**

by Marie Spano

#### **INSIDER's Take**

- Plant proteins are popular ingredients, but with their unique taste and texture, pose challenges for food scientists who create functional foods and beverages.
- The first step in flavor masking is managing expectations, as the taste of certain ingredients may not disappear completely.
- Fat and sugar create the mouthfeel consumers crave, yet the growing demand for low-fat and -sugar products means creative solutions are necessary.

#### Food scientists face many challenges. From the undesirable flavors and textures

of plant proteins, which can vary from batch to batch, to chalky textures and creating hot functional products with efficacious doses of key ingredients, formulators have their hands full.

"The rapid advancement of plant-based proteins has created two key issues facing developers: mouthfeel and lingering off-flavors," said Blake Wester, senior applications scientist (beverage) at Flavorchem. Total protein quantity also can be an issue, particularly for drinks and bars. Justin Kozlowski, director of flavor operations, Imbibe, noted, "When functional ingredients are added to beverages at higher levels, they tend to create off-notes. This is especially common with protein beverages that have high amounts of protein in a single serving." And higher levels of protein in bars can result in a hard, dry product.

Each plant protein has its own unique taste and texture, and can't be treated the same way dairy proteins are treated. Like many other functional ingredients, sourcing matters, as the same type of plant protein can vary in taste and texture based on processing methods. For instance, one batch of pea protein from a supplier can taste different than a batch from a different supplier.

Brown rice protein is dry and, at times, described as having a mouthfeel similar to sawdust. However, concern about arsenic may be a bigger issue for manufacturers of brown rice protein. As a growing number of specialized labs are including heavy metals in blood tests, arsenic—a heavy metal found in higher amounts in rice—is taking center stage. Thorough and transparent testing of rice protein ingredients prior to formulation, along with a good communications plan, may help ease consumers' minds.

Pea protein can impart an earthy, grassy or beany aftertaste, and gritty texture. Though great in a salad, consumers are not lining up to taste peas in their fruit-flavored protein shakes. Hemp protein also has an earthy taste and an unfortunate association with the cannabis plant from which it is derived. Though food-grade hemp seeds must contain less than 0.3 percent tetrahydrocannabinol (THC)—the psychoactive constituent of cannabis—the seeds may not be 100 percent THC-free due to contamination from

IN THIS ISSUE Flavor-Masking Ingredients p.14

Market Data p.26



Each plant protein

has its own **unique taste** and **texture**, and can't be treated the same way dairy proteins are treated. other parts of the plant during processing.<sup>1</sup> Competitive athletes tested for banned substances may feel the health benefits of hemp aren't worth the potential risk of testing positive for THC. Sacha inchi seeds provide the protein of choice for some of Tom Brady's TB12 line. The ingredient has a nutty flavor and works as a stand-alone protein, or can be formulated along with other plant proteins.

In addition to challenges arising from the demand for plant-based foods and beverages that are higher in protein, many functional ingredients present undesirable flavors and textures, particularly when added in efficacious doses. This makes meeting the demand for great-tasting, healthy products a competitive obstacle race to the marketplace.

#### **Formulating Exceptional Flavors**

Masking the flavor of plant proteins, functional ingredients and sugar substitutes is big business. Whether it's the licorice notes in stevia, the bitter aftertaste of caffeine or branched chain amino acids (BCAAs), covering undesirable flavors starts with defining expectations.

Even with advances in food technology to help drastically decrease off-notes, the taste of certain ingredients may not disappear completely. Wester doesn't like to use the word "masking." "It gives the impression that we can make all the off-notes go away with some magical ingredient. No flavor system can completely do that. The art of the developer lies in using flavors that complement the off-notes or work to distract the taste buds," he said.

Rather than trying to completely conceal the off-flavors in plant proteins, complementary flavors such as coffee, cocoa, honey and peanut can be used by starting with an assessment of the plant protein on its own.

Rather than trying to completely conceal the off-flavors in plant proteins, complementary flavors such as coffee, cocoa, honey and peanut can be used by starting with an assessment of the plant protein on its own. Combining plant proteins, rather than using them in isolation, can improve the taste profile as well. This approach is also best for the consumer. Soy is the only plant protein that contains all the essential amino acids in the ratios needed to form a complete protein, and it can therefore be consumed in isolation and still contribute to a robust increase in the synthesis of new proteins in muscle.

Other plant proteins lack one or more of the essential amino acids, and they are therefore best when combined to give a complete array of the essential amino acids. This is necessary for optimal synthesis of new proteins in muscle tissue, something that is important for athletes and fitness enthusiasts. In addition to nourishing marketing claims, combining plant proteins also will make a better-tasting final product. After the taste profile of the main ingredient (whether protein or something else) has been considered on its own and in context with the application (bar, cereal, snack item, beverage, powder, etc.), the need or consumer desire for additional compounds (vitamins, minerals, amino acids, phytonutrients and other ingredients) must be weighed, and their taste profile considered.

Amino acids, caffeine and other ingredients with undesirable tastes can be encapsulated to bypass the mouth's taste receptors. Yet, encapsulation can be costprohibitive and best for certain applications such as bars. Another option involves using micro- or nano-structures to bind bitter compounds in the mouth, while allowing them to go to work soon after they are swallowed. This works well in beverages. Cyclodextrins also provide a physical barrier. The various chemical structures of cyclodextrins bind to bitter-tasting amino acids and suppress the bitterness of catechins, soy and whey protein hydroxylates.<sup>2</sup> Different forms of cyclodextrins are needed for each specific purpose.

Robert Price, North American product manager at Mitsubishi international Food Ingredients, uses highly branched cluster dextrin to mask the bitterness of BCAAs and essential amino acids in beverages. "BCAAs and essential amino acids nestle in the highly branched structure, which helps mitigate their strong bitterness when formulated together with acidulants," he said.



Another option involves using micro- or nano-structures to bind bitter compounds in the mouth, while allowing them to go to work soon after they are swallowed. This works well in beverages.

Like maltodextrin, cluster dextrin isn't sweet and qualifies for "no added sugar" claims. However, consumers may soon catch on to this misleading claim. Like sugar, cluster dextrin is fast-absorbing and rapidly spikes blood sugar and blood glucose (if consumed when not exercising; during exercise it is used right away). Also, claiming "no added sugar" is misguided, as decades of research show sugar can be beneficial during exercise, providing an instant source of energy to sustain high-intensity performance while also sparing use of limited stores of glycogen.<sup>3</sup> Contrary to popular belief, highglycemic carbohydrates don't cause a sugar spike then crash, as they are rapidly used during exercise.<sup>4</sup>

In addition to encapsulation, micro- or nano-structures, cyclodextrins and cluster dextrin, different gum systems can also be used when working with undesirable tastes. Gum systems bypass taste receptors by coating the mouth. The undesirable flavors pass through, followed by a pleasant flavor afterward. Formulation

Imbibe utilizes bitter-masking flavors, and will be introducing a line of proprietary bitter-masking flavors "that reduces the undesirable flavor characteristics from most minerals and amino acids for functional properties in a beverage," Kozlowski stated. Wester takes a different approach. Rather than attempting to cover strong bitter tastes, he works with the inherent flavor. "If we have an ingredient that imparts a bitter off-note, we may use a grapefruit flavor, where you would already expect some bitterness. We also can adjust the sweeteners and acidulants to help balance the overall flavor perception of the beverage. That being said, there are some flavor compounds that work for particular off-notes, but those generally work to smooth out the intensity, rather than completely mask," Wester said. Others use a combination of sweet, sour and salty flavors to help balance strong bitter notes. In addition to grapefruit, coffee and chocolate flavors are expected to be bitter.

#### **Creating a Desirable Mouthfeel**

Fat and sugar create the mouthfeel consumers crave, yet the growing demand for lower-fat, lower-sugar products means creative solutions are necessary. At times, this puts added pressure on formulators to create a synergy between mouthfeel and taste.

"Customers are requesting lower-fat and -sugar products, so we use a wide range of flavor systems to alter mouthfeel after fat and sugar are reduced," Kozlowski explained. "High-protein beverages, such as ones containing whey protein, can create a dry mouthfeel. To combat dry mouthfeel, Imbibe adds a flavor and sweetener system to enhance the flavor, which makes the flavor last longer and thus reduces the sensation of the dry mouthfeel."

Wester also uses some modifying flavors when tackling mouthfeel, but primarily relies on hydrocolloids, dietary fibers and a balanced sweetener system. Hydrocolloids are long-chain polymers (polysaccharides and proteins) that enhance the mouthfeel of products. When decreasing sugar or fat, hydrocolloids can help make up for the loss in body and texture. All hydrocolloids disperse in water to thicken applications and provide a sticky texture. They can also gel, emulsify, control the crystal growth of ice and sugar, and stabilize. By altering viscosity and the texture of foods, sensory properties are enhanced in many applications, including gravies, sauces, salad dressings and soups.

Common hydrocolloids used as thickening agents include starch, modified starch, xanthan, carboxymethyl cellulose and several gums, such as guar gum and locust bean gum.<sup>5</sup> Starch is one of the more commonly used thickening agents, and recognizable ingredients such as potatostarch and oat starch are better options for clean labels. When starches are combined with gums for superior functionality, non-genetically modified organism (GMO) gums are preferable for clean labels. Many clean label, non-GMO hydrocolloids are available, including guar







gum, methylcellulose, inulin, locust bean gum and xanthan gum. Among these, inulin and xanthan gum are prevalent in natural products.

#### **Addressing Shelf-Life Concerns**

Shelf life is another challenge that can affect overall formulation while companies try to meet label claims and deliver on health benefits. Wester said his group pays careful attention to the overall formulation and processing to ensure they are delivering on label claims throughout the shelf life of the product.

"This involves extensive shelf-life studies for new products and constant evaluation of market samples," he said. "We use this information to tell us how to modify the processing parameters or how much overage must be included in the formula for each functional ingredient to compensate for degradation over the shelf life."

Careful attention to ensuring label claims are met will prevent companies from landing on Consumerlab.com's list of products that don't meet label claims and subsequent news articles highlighting companies that are perceived to cut corners. Flavorchem accounts for vitamins lost during processing by adding more to ensure they are meeting label claims through the end of the product's shelf life. "Vitamins, for instance, are often added at 200 percent or more of what we claim on the label," Wester said.

Like making a recipe in a kitchen, starting with high-quality raw ingredients is the first step to developing a great product that delivers the taste and mouthfeel consumers desire. But consumers aren't willing to compromise taste for health.<sup>6</sup> Therefore, rather than dumping in functional ingredients without close consideration paid to the end consumer, it is important to carefully assess whether added vitamins or minerals or other ingredients make or break a product. Many ingredients, such as amino acids added to a protein powder, aren't necessary and create potential obstacles to delivering exceptional-tasting products. The greater the complexity in formulations, the greater the chance for an undesirable flavor or texture to occur during processing. Certain ingredients present greater challenges than others and may require figuring out if the off-taste is due to a single ingredient, a blend or the processing method. In a world where "eat real food" is a growing mantra, simple may be best—for taste, mouthfeel and delivering targeted health benefits.



Marie Spano, R.D., is a sports dietitian, food industry consultant and freelance writer who covers everything from functional ingredients to the latest research on dietary fats. She has appeared on CNN, Fox, ABC, NBC and other network affiliates throughout the nation, and is currently working on a nutrition textbook.

#### References

- 1. Ross S et al. "GC-MS analysis of the total delta9-THC content of both drug- and fiber-type cannabis seeds." J Anal Toxicol. 2000;24(8):715-7.
- 2. Hayes J. "Physical Approaches to Masking Bitter Taste: Lessons from Food and Pharmaceuticals." Pharm Res. 2014;31(11):2921-2939.
- 3. Stellingwerff T et al. "Carbohydrate supplementation during prolonged cycling exercise spares muscle glycogen but does not affect intramyocellular lipid use." *Pflugers Arch.* 2007;454(4):635-647.
- 4. Ormsbee M, Bach C, Baur D. "Pre-Exercise Nutrition: The Role of Macronutrients, Modified Starches and Supplements on Metabolism and Endurance Performance." *Nutrients.* 2014;6(5):1782-1808.
- 5. Saha D, Bhattacharya S. "Hydrocolloids as thickening and gelling agents in food: a critical review." J Food Sci Technol. 2010;47(6):587-597.
- 6. Verbeke W. "Functional foods: Consumer willingness to compromise on taste for health?" *Food Qual Pref.* 2006;17:126-131.





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## **Functional Foods & Beverages:** A Purpose-Driven Trend

by Steve French

#### **INSIDER's Take**

- More consumers are educating themselves and taking an authoritative role regarding how to live a healthier lifestyle.
- Consumers are more likely to purchase a food or beverage that touts energy, weight management, brain health and heart health benefits.
- O The package label is cited as the strongest influencer of healthy and natural product purchases.

#### "You are what you eat" is an oft-touted phrase, yet it is particularly relevant in

today's health-conscious society, where food and diet play a key role in health and wellness. Most consumers believe a healthy diet is directly related to a healthy lifestyle. This can include foods that are organic and "clean" (nothing artificial, minimally processed ingredients, etc.), have fewer "negative" qualities (and therefore are positioned to be low-fat, low-sugar, low-carb, etc.) and foods that are functional.

Functional foods are "foods with purpose;" that is, they provide specific, additional health benefits that extend beyond basic nutrition. This includes foods that have benefits inherent within the ingredients themselves, such as naturally high omega-3 fatty acids found in salmon, which may lower the risk of heart disease. Or functional benefits can be provided via a "value added" ingredient such as calcium—shown to help strengthen bones—added to orange juice or cereal.

Natural Marketing Institute's (NMI) annual Health & Wellness Trends Database<sup>®</sup> (HWTD) highlights consumers' attitudes and behaviors toward a wide array of issues related to trends in food and beverage usage. These insights, gleaned from a nationally representative sample of more than 66,000 U.S. adults trended annually over 19 years, provide an understanding of the attitudes, motivations and behaviors surrounding today's functional food trend.

#### **Today's Health-Engaged Consumer**

Consumers use a wide range of methods to manage their health and are driven by various reasons to do so. Understanding which issues are becoming more important to consumers reveals opportunities for industries positioned in the health and wellness space. In addition, more consumers are taking an authoritative role regarding how to live a healthier lifestyle, indicative of a growing, informed consumer base.

> More than three-quarters of American adults believe that consuming a healthy, nutritious diet is very important to maintaining a healthy lifestyle. In fact, doing so helps consumers feel in control of their health, which is a much

IN THIS ISSUE FO

Formulation p.20

Takeaways p.29

Table of Contents p.2

higher-order consumer benefit than just dietary consumption. And by choosing foods and beverages that "work" for them, consumers are proactively managing specific health issues and medical conditions. Since 2009, a twofold increase of consumers believe consuming functional or fortified foods is important in maintaining their health. Such consumers have become resolute in making purposeful choices.

#### **Top Health Drivers**

Incorporating foods with purpose goes beyond making healthy choices. More than eight in 10 people believe they can manage specific health issues through proper nutrition (up from 69 percent in 2009). In fact, consumers want their foods to be functional and are looking for them to provide a wide range of health benefits.

Boost Energy	41%
Help Lose or Maintain Weight	39%
Improve Memory and Focus	38%
Provide Heart Health	38%
Lower Cholesterol	36%
Boost Immunity	36%
Strengthen Bones	36%
Help Prevent Cancer	35%
May Reduce Risk of Heart Disease	34%
May Reduce Risk of High Blood Pressure/Stroke	34%

#### **Top Health Benefits Driving Food/Beverage Purchases**

Source: NMI's 2017 Health & Wellness Trends Database

#### **Generational Differences**

While the importance of functional foods is strong among all consumers, key generational differences provide insight regarding growth opportunities and targeting. Strong growth (from 2009 to 2017) comes from Millennials' belief that consuming functional or fortified foods is important to maintaining health. This cohort is focused on self-care, and the data indicative of the group's influence in growing the category.



Source: NMI's 2017 Health & Wellness Trends Database

#### **Loaded Minimalism**

Loaded minimalism is a trend that embodies consumers' desire to find balance between adding beneficial foods and/or ingredients to their diet, while simultaneously looking to minimize negatives, such as sugar, processing and hormones, among many other items. This is the basis of the loaded minimalism trend driving consumer demand for organic and low/no foods, in addition to foods that provide positive benefits or have a health claim. Foods such as Back to Nature<sup>®</sup> Harvest Whole Wheat Crackers are a prime example of loaded minimalism. The original flavor contains four ingredients, one of which is whole wheat—a highly desired ingredient. Manufacturers need to balance consumers' desire for functional foods with their need for natural ingredients, all while providing tasty solutions.

#### The Relevance of the Label

The package label is cited as the strongest influencer of healthy and natural product purchases. In fact, because consumers are paying attention to messaging on labels, marketers have a prime opportunity on the product label to engage consumers and inform them about benefits of use, health claims, and social and environmental initiatives (another realm in which food can be "functional"). This product transparency will provide value to the consumer, allowing individuals more control and self-reliance regarding their health.

Functionality will continue to be a big part of the future of food, as consumers increasingly want to maximize their personal return on investment (ROI). Consumers clearly show a higher demand for foods and beverages that provide inherent health benefits, whether it be in products that offer value-added ingredients or have naturally occurring benefits. A successful market strategy will address this emerging demand and incorporate an understanding of consumers' differing and changing needs.

As Anthelme Brillat-Savarin, a renowned lawyer, politician and author stated in 1826, "Tell me what you eat, and I will tell you what you are," ... a phrase that still resonates today.



<u>Steve French</u> is a managing partner at the <u>Natural Marketing Institute (NMI)</u>. NMI is a strategic consulting, market research and business development firm specializing in the health, wellness and sustainability marketplace.

## Takeaways: The Future of Functional Food & Beverages

by Judie Bizzozero

#### Increased consumer awareness of the long-term benefits of proper nutrition

in overall health, as well as how it relates to specific health conditions, is driving new product development in the global market for functional food and beverages that is predicted to reach US\$255 billion by 2024, according to Grand View Research Inc. But slapping a health claim on a nutrition bar won't get brands far if the product doesn't deliver desired results. Product developers and brands must keep in mind consumers are looking for products that include efficacious levels of functional ingredients, such as protein, omega-3s, calcium, fiber, etc., that can support various aspects of wellness and provide promising health benefits.

Established players in the functional food and beverage category, or brands looking to enter the game, should consider these market dynamics:

**Identify the target market.** Key generational differences provide insight regarding growth opportunities and targeting, so research how shifting consumer demographics and needs among Baby Boomers, Generation Xers and Millennials affect their food and beverage purchasing decisions. By choosing foods and beverages that "work" for them, consumers are proactively managing specific health issues and medical conditions.

Since 2009, a twofold increase of consumers believe consuming functional or fortified foods is important to maintaining health. Such consumers have become resolute in making purposeful choices. Millennials represent the largest population of consumers—88 percent—who believe consuming functional food is important to a healthy lifestyle, followed by Gen Xers (42 percent) and Baby Boomers (36 percent).

**Understand formulation challenges.** Taste is always No. 1 in consumers' minds, which means food developers must balance the beneficial effects of myriad nutritional ingredients and their chemical interactions during processing techniques such as high pressure processing (HPP) and ultra-high temperature processing (UHT) in the final product's texture, appearance, stability, shelf life and cost. Outline the desired result and consult with suppliers to find the best ingredients to help counterbalance off-notes sometimes associated with functional ingredients, such as proteins and botanicals.

**Taste trumps function in many cases.** Even though consumers are looking for products that benefit overall health, they also are aware of caloric intake and seek products containing clean label sweetener alternatives such as stevia, monk fruit, agave, erythritol and natural fibers that allow for calorie reduction without sacrificing flavor profile. These ingredients aren't necessarily 1:1 replacements for sugar, and at times, it's necessary to use a mixture of ingredients to create the ideal flavor profile.

IN THIS ISSUE Market Data p.26 INSIDER Contacts p.30 Table of Contents p.2

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