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The Beverage Edition: Challenges in Functional Beverages

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The functional beverage market is as inventive and healthy as it is robust. This market is not only serving up flavor mashups, pretty colors (or none at all), and palatable tastes, but it's also introducing new functional ingredients into everyday beverages.

According to a report from Research and Markets, *Functional Beverage Market - Growth, Trends, and Forecast, 2020-2025*, the global functional beverage market is projected to experience a CAGR of 8.66% from 2019 to 2024.¹ Although North America is the largest market, Asia Pacific is slated for the fastest growth.

What's more is consumers are willing to pay a premium for these enhanced beverages. "Consumers have started to prefer functional drinks over fruit juices and carbonated drinks, and manufacturers are embracing innovation for gaining

position in the market," the report noted. "One of the major advantages of functional beverages is that consumers are ready to pay a premium for their various functional advantages."

Brain + Sports

From active nutrition to hybrid beverages featuring ingredient duos or drink combos (juice + water), beverages are getting an ingredient and formulation makeover. The most popular functional beverage categories, according to Holly McHugh, marketing associate at Imbibe, are "beverages that deliver key nutrients, energy drinks, protein drinks, and digestive-health products."

In its *2030 Global Food and Drink Trends*, Mintel said: "More consumers are considering mental health alongside diet and exercise in their personal health management. This holistic health and wellness approach has inspired consumers

to seek products that can improve mood and boost brain health, as well as those with emerging functional ingredients.”

Popular ingredients in mood- and relaxation-enhancing beverages will be lavender, chamomile, cacao, and hemp-derived cannabidiol (CBD), according to McHugh, and mood-boosting ingredients like adaptogens and medicinal mushrooms.

Jim Tonkin, founder and president of Healthy Brand Builders, named CBD-based beverages, pre- and probiotics, and plant proteins as hot ingredient inclusions, and he also labeled brain-health drinks as one of the most popular categories in functional beverages.

Tonkin also named energy and sports nutrition as hot categories. In fact, according to Euromonitor International, between 2014-2019, the U.S. sports nutrition market grew at an impressive 10.3% CAGR, sitting at \$13 billion in 2019.²

“Within the growing category of sports nutrition, which has now transformed from just core protein users to

mainstream due to the rise of emergent users, the new trend is convenience,” said Eric Meppem, co-director at Pharmako Biotechnologies. “Ingredients have to be ready to mix, to fit into existing product formats, or be novel so they can meet the demand for convenience.”

Will Cowling, marketing manager for FMCG Gurus, said protein will continue to be a popular ingredient in beverages due to its myriad health benefits. “Moreover, the evolution of sports-nutrition products into the mainstream means that products are well placed as better-for-you offerings as consumers look to maximize health,” he said.

Drink Trends

At the end of 2019, Imbibe—creator of custom beverages, flavors, and ingredients—predicted four beverage trends for 2020:

- **Holistic wellness.** Beverages that support physical and emotional well-being.
- **Hyper-personalization.** These drinks fulfill consumers’ lifestyle goals via customization.
- **Hybrid beverages.** Drinks that combine energy + popular sports-nutrition ingredients, caffeine/ coffee + functional

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Sports Nutrition Concepts and Formulations

ingredients, prebiotics + probiotic (i.e., synbiotics), etc.

- Experimental drinking 2.0. Low-to no-alcohol drinks that offer functional ingredients such as CBD.

Mintel also identified customized/ personalized products as a new opportunity for brands to connect with consumers. According to its report: “In the next 10 years, consumers will be able to use easily accessible and affordable customized biological tests, data collection, and analysis to learn what makes their bodies one of a kind. The results will help consumers better understand how to address every aspect of their health, including brain and emotional health. While respecting consumer privacy, food, drink, and food service companies will have opportunities to develop personalized recipes, custom diet plans, and individualized products.”

There is a link between consumers’ access to information about their personal biology and their purchasing habits. “Brands will need to offer more personalized product offerings, smart home solutions, and explore how to help consumers address mood and brain health,” said Sam Moore, global food and drink analyst at Mintel, in the company’s report.

Moreover, in the firm’s report, Mimi Bonnett, director - food and drink,

foodservice at Mintel, said hybrid drinks are at the heart of growth and innovation in the non-alcoholic beverage market. “While just 13% of U.S. adults overall report drinking hybrid beverages, the most engaged consumers—iGens, Millennials, parents, and Hispanics—are often young and influential,” she said.

While beverage trends are being shaped by consumers’ increasing interest in mental wellness, their personal tastes and likes, and synergistic ingredients, beverage formulators are busy creating inventive drinks that meet the market’s needs. But formulation challenges such as taste, texture, and efficacy still present hurdles when working with both mainstay and new-to-the-scene ingredients.

Formulation 101

Two of the top formulation challenges, according to Tonkin, are taste and cost per dose. Many of the popular functional ingredients have off flavors that disrupt taste, and the more an ingredient is added, the likelier it is to impact flavor.

“Many of the newer and more potent ingredients that work at efficacious levels present major taste hurdles, and without good taste, the beverage fails,” he pointed out. “And some of the really good ingredients that are efficacious are very expensive to use, which is almost prohibited in a competitive functional beverage.”

“Protein is the go-to ingredient in many beverages, from sports nutrition to weight management.”

This is where technology can play a role. “Technology, which can improve functionality and bioavailability, allows less product to be used while the end consumer is still receiving the proper therapeutic dosage,” Meppem said.

The ability to apply technology to ingredients also allows for new innovations to arise such as water-dispersible curcumin and/or palmitoylethanolamide (PEA). “Hydrocurc® and Levagen+® use LipiSpense® delivery technology, which allows for format versatility. Ingredients that were once restricted to capsules and tablets, can now be incorporated into effervescent, ready-to-drink stick packs, and shots” said Mariko Hill, product development executive at Gencor.

Another hurdle is processing. McHugh said that many functional ingredients are negatively impacted by high temperatures used during processing. “The higher the temperature, and longer the time exposure, the more risk of functional ingredient degradation,” she said. “As a result, beverages processed

under ultra-high temperatures (UHT) or retort often suffer the most functional ingredient loss. To combat losses during processing, formulators typically add an appropriate amount of overage to their products. Other steps can be taken to protect functional ingredients such as using encapsulated forms or, depending on the mechanism of degradation, the addition of antioxidants.”

Formulators must know, and pay attention to, the processing requirements for a beverage, Tonkin warned. “Without understanding that, it’s tough to formulate/produce correctly with good outcomes.” He said that high-pressure processing (HPP) is great for juice-based or non-heated type products, but it doesn’t work on everything. “Conversely, ultra-high-temperature (UHT) pasteurization doesn’t work for all beverages to prevent bacteria.”

The Protein Challenge

Protein is the go-to ingredient in many beverages, from sports nutrition to weight management.

“For Americans, protein is the nutrient that can do no wrong,” said Julian Mellentin, director and founder of New Nutrition Business. “It’s health halo means that in anything, like ice cream, for example, it gives you permission to indulge. In fact, that’s an interesting angle about proteins—they’ve gone from being serious about health into

indulgence products.” So even though consumers are buying ice cream, they feel good about buying something with protein in it.

“What’s been good for protein is it’s become a weight-management message,” Mellentin continued. “But you never have to use those words; protein never has to talk about maintaining or losing weight. Mainstream and social media have educated people on the science of protein—it’s the one that helps keep your body firm, in good tone, keeps the weight off. You can argue that protein is the prince of weight-management ingredients.”

However, protein isn’t the easiest nutrient to work with. McHugh said taste, texture, and stability are the most common issues with protein-based drinks. “Many proteins have off-notes that need to be masked,” she said. “Unpleasant mouthfeel is one of the biggest complaints consumers have about protein beverages, and there are several ways to address it. Finding the right ingredient source, level, and combination of raw materials, along with the multitude of processing variables will greatly improve the chances of delivering a consumer-preferred texture.”

McHugh recommends stabilizers such as carrageenan, xanthan gum, pectin, and gum arabic to improve product stability. “They prevent larger particles

like proteins and fats from interacting, forming larger particles, and eventually, separating out of your beverage system,” she explained. “Additionally, mineral carbonates, phosphates, and citrates can also be used as buffers to stabilize pH and prevent proteins from settling out.”

Tonkin said plant proteins and other amino-acid long chains are more difficult to work with than protein staples like whey protein isolate. “They have taste profiles that are not pleasant—just taste some of the pea protein-based beverages at 20 grams without lots of sugar/sweetness, they fail,” he said.

“Another hurdle with protein is product differentiation—how are you going to make your product stand out? Is it convenience, added ingredients for health benefits, new flavors, or formats?” Meppem said.

Formulators can differentiate by “including tier 3 ingredients, i.e., ingredients with substantial scientific evidence, to the core tier 1 ingredients such as well-established proteins, branched-chain amino acids (BCAAs), essential amino acids (EAAs), etc., for value-added benefits,” Hill said.

Often flavor systems work together to overcome unpleasant tastes with sensory effects. Masking agents are also introduced to offset unfavorable notes that soy, dairy, and other types of proteins can impart.

The Sweet Stuff

As Tonkin mentioned, sweetness is an essential part of a beverage's taste profile. Sugar is not only a flavor agent; it has functional purposes as well.

"Sweeteners are a real issue today," he said. "I am still a big fan of sugar in a low volume—5 grams or fewer—because it adds great modulation to flavor and mouthfeel. Many of the sugar alcohols such as xylitol and erythritol are expensive and unable to obtain organic status. The new non-nutritive and non-caloric sweeteners such as allulose, monk fruit (luo han guo), and agave also have their own taste issues when incorporated into beverages."

McHugh said that although there are several tools to reduce or replace sugar, there's no sweetener or technology that's a 1:1 match. "Sugar has a very distinct sweetness profile that consumers have grown very accustomed to," she said. "That is, sugar hits the palate quickly with high intensity up front and a slight pleasant linger absent of any negative off-notes. No alternative ingredient exactly matches sugar and many substitutes have off-notes, especially at higher usage levels.

"Other sugar replacements that are becoming more prevalent are date paste and coconut sugar."

Beverage manufacturers are tasked with matching the sugar sweetness profile using combinations of different components to try to mimic the sugar-like experience consumers love."

McHugh cited inulin as a part of that sweetness combo, "not only because it may impart sweetness in products, but also for the potential fiber claim." Other sugar replacements that are becoming more prevalent are date paste and coconut sugar.

Color Blocked

In 2018, 19% of U.S. consumers said the phrase "no artificial colors/flavors" influenced their purchase decision when buying foods and beverages, according to Innova Market Insights.

As consumers move away from artificial ingredients and on to cleaner labels, the use of artificial colors is decreasing; however, natural colors derived from fruits and beverages are tricky to formulate with, despite their healthier claim—light, temperature (many natural colors need to be kept cold), storage, processing, and precipitation all impact natural colors.

"Before clean label became common, most beverages were colored using synthetics to maintain color intensity, so bright, bold colors are something consumers have come to expect," McHugh said. "Natural colors are more

sensitive to pH, light, and fading due to heat during processing, so product developers must choose natural colors that will maintain intensity throughout processing and on the shelf.”

Many manufacturers are solving these issues through packaging, proprietary emulsion technologies, and micro-encapsulants.

The Last Sip

As the functional beverage market continues to expand, so does its ingredient portfolio and categorial reach. And although functional ingredients present a host of challenges, the industry is innovating ways to incorporate healthy inclusions into everyday beverages.

References

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Powered by Turmeric

Powder-based functional ingredients that fit into consumers’ on-the-go lifestyles are continuing to grow. A popular ingredient in this category is turmeric. SPINS reported out of all the turmeric product categories it tracked in 2018, refrigerated juices and functional beverages were the fourth largest, compiling nearly \$12 million in U.S. sales and falling just a few million behind shelf-stable teas. Turmeric is also used as a natural color agent in beverages.

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