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# *Taking Beverages* Back to Nature

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# Formulating Functional Snacks

by Judie Bizzozero

## INSIDER's Take

- Bars with a fiber claim are the second-most active food-and-drink subcategory.
- Taste is always a challenge when using functional ingredients such as proteins and fiber.
- Plant-based proteins, such as soy and legumes, are rising stars in the snack sector.

### Snacking has become the American

way, with nearly 94 percent of consumers reaching for a snack at least once a day, and 50 percent of adults snacking two to three times per day. But today's consumers are looking beyond basic nutrition and seeking out tasty, portable snacks made with simple, clean-label ingredients that deliver on functionality.

Functional ingredients currently trending in clean-label snack applications include plant and dairy proteins, fibers, whole grains, prebiotics and probiotics. But adding functional ingredients to snacks isn't as easy as it might appear, and product developers must rise to the challenge of ensuring the shelf life, texture and flavor integrity of fortified snacks on the retail shelf.

### It's All About the Function

Consumers are increasingly looking for snacks that pack a mix of protein and fiber while boosting satiety, and the pairing of dried fruit and nuts is ideal for this application. In fact, dried fruit consumption has increased 24 percent in the last decade, and tree nut production has increased 55 percent, according to Jeff Manning, chief marketing officer, Cherry Marketing Institute.

Snack makers also are turning to fruit, such as Montmorency tart cherries, to be able to make a health claim on the label. Manning cited more than 50 scientific studies supporting the health benefits of the natural superfruit that adds flavor, texture and nutritional value to snacking.

"From soothing [joint soreness] and easing muscle pain after a workout to enhancing sleep, Montmorency tart cherries have been credited with an array of health advantages," he said. "They also are a natural way to help bind dry ingredients, increase moisture and create texture, which can all be challenging when formulating or producing snack foods. Further, they have low water activity and can be used in low-moisture snacks."

2016 trend research from Innova Market Insights identified the rise in clean/clear labels, protein-packed items and free-from options such as gluten and dairy alternatives. Molly Spence, regional director, North America, Almond Board of California, said almonds are functional in a range of snack applications and are extremely versatile in product development—from adding crunch with diced or chopped [nuts] to lending depth with almond milk or almond butter. Furthermore, almonds lend creaminess to dairy-free products and function

as a base for many gluten-free formulations.

"We continue to see innovation in flavored almonds, with new flavors all the time, as well as almonds being used in trail mixes and snack mixes, including

those from candy companies that are making efforts to gain snack share of the stomach," Spence said, noting almonds are the number one nut consumers associate with snacking. "Each ounce of almonds contains 4 g of fiber and 6 g of protein, and ounce for ounce, almonds are the tree nut highest in protein, fiber, vitamin E, calcium, riboflavin and niacin. They also have 13 g of 'good' unsaturated fat and only 1 g of saturated fat and boast notable heart-smart attributes."

Ricardo Rodriguez, marketing manager, confectionery & bakery, Ingredion Inc., said bars with a fiber claim are the second-most active food-and-drink subcategory behind cereals with the number of U.S. new product launches. What's more, market data showed consumers rank protein very high as a desired nutrient.

However, overall taste is always a challenge when using functional ingredients like proteins and fiber. Kim Cornelius, food technologist, Wixon, cited protein powders as an example because while they provide an additional health benefit, they tend to give a strong flavor that is typically not favorable. "Finding ways to mask or diminish that strong protein flavor can be challenging, but there are many products that mask the off-notes while enhancing the rest of the flavor profile," she said.

Rodriguez said some proteins' off-notes limit the type of protein that can be used when making a clean-label claim such as allergen-free. Ingredion offers a deflavored version of its pulse proteins that can be used in order to achieve the best taste profile.

"Pulses add the nutritional benefits of protein that address consumer need for protein-rich, clean-label products. They can boost the nutritional profile of formulations, replace allergens and also help support popular label claims such as non-GMO (genetically



modified organism), vegan and gluten free,” he said, noting Ingredion’s pulse-based ingredients are available as flours or proteins from peas, lentils, faba beans and chickpeas.

Lesley Nicholson, marketing manager, WILD Flavors & Specialty Ingredients, said consumers want mini-meals to provide satiating protein, which is making plant-based protein such as soy and beans rising stars.

“These plant-based proteins are the preferred choice because they are sustainably sourced and can be used in so many different forms,” she said. “A great example of how these proteins can be combined is the Textura line of extruded protein crisps that can add texture, protein and taste great in many different applications from bars to snack mixes to yogurt toppers.”

Nicholson said customizing Textura for protein content, shape and size, or added natural colors is an easy way to differentiate a snack. However, the challenge for formulators is to balance all of the consumer wants with great taste and convenience and still give them something unique in a crowded space where “anything can be a snack.”

### Consumers want mini-meals to provide satiating protein, which is making plant-based protein such as soy and beans rising stars.

Ancient grains such as quinoa, millet and chia seeds also are opening the door for snack makers to deliver gluten-free, protein-rich products made from simple ingredients that consumers understand. And ingredients such as milk protein concentrate are being added to yogurt, protein dips, baked snacks, protein bars, nut butter and more.

“By adding products such as milk protein concentrate to snack foods, it is an easy way to pack in extra protein without adding a surplus of calories,” said Nick Cosinteno, marketing specialist, Idaho Milk Products. “In addition to milk proteins, we see an increase in demand for milk permeate in baked and savory snacks.”

Product developers are becoming more adept at formulating snacks with whey protein to ensure they taste great, retain a pleasant texture for a longer time and, of course, offer exceptional nutritional value.

“Snacks high in whey protein deliver excellent satiety and can have a favorable effect on blood glucose levels, weight and body composition,” said Anne Poulsen, business development manager, performance health & nutrition, Arla Foods Ingredients. “Some proteins, including whey, don’t impair flavor and texture, which means they can be used to reduce carbs and sugar in snacks with no negative impact on taste, making them much more appealing to health-conscious consumers in particular.”

Another trend in the snack category is the addition of probiotics and prebiotics. “Probiotic functional foods and beverages are growing in popularity, and we’re seeing a compound annual growth rate (CAGR) of 6.2 percent over the next several years to reach US\$36.7 billion in 2018,” said Mike Bush, senior vice president of business development, Ganeden.

But formulating with probiotics presents a challenge in that probiotic strains are unable to withstand many of

the manufacturing processes required to produce snack foods. Bush said GanedenBC30’s unique structure safeguards the cell’s genetic material from the heat and pressure of the manufacturing process, adding, “It easily incorporates into products, overcomes shelf-life challenges and withstands the acid and bile to which it’s exposed during digestive transit.”

“Snacks also can serve as a simple way for consumers to get more fiber—something they know they need,” said Carol Lowry, food scientist,

Cargill, noting Cargill’s Oliggo-Fiber chicory root fiber offers a label-friendly option to incorporate more fiber into most any snack without affecting the taste or texture of the final product. What’s more, chicory root fiber is a prebiotic ingredient that helps promote digestive health.

### All About Reduction

The 2015 Dietary Guidelines for Americans (DGAs) called for a number of key changes to Americans’ diets, including limiting calories from added sugars and saturated fats, and reducing sodium intake. However, formulating (or reformulating) foods with reduced levels of sugar and sodium can be challenging.

“It can be hard to create savory snacks without adding extra sodium, but tasty, satisfying savory flavors can be achieved by using milk permeate,” Cosinteno said. “Milk permeate consists of lactose, vitamins and minerals that give finished products a salty taste and act as a flavor carrier without the extra sodium.”

Formulating healthy and tasty snacks can be made easier by working side by side with a supplier that has a comprehensive toolbox of ingredient solutions. “This approach enables manufacturers to look holistically at their products to ensure they’re delivering on consumer demand without sacrificing the extraordinary eating experience their consumers are accustomed to,” said Amy Lauer, North American marketing manager, Tate & Lyle.

Lauer cautioned not all ingredient solutions are a 1:1 exchange, and when swapping caloric sugars for a high-potency





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## Food: Snacks

sweetener, a fiber like beta-glucan might need to be added to build back both body and mouthfeel. “The addition of fiber provides the opportunity to maintain texture and add health-benefit claims that contribute to the overall consumer appeal of the product,” she said.

While consumers desire convenience, fortification and better-for-you snacks, they want to keep calories in check, said Lorraine Niba, Ph.D., global director, nutrition innovation, Ingredion Inc.

In fact, the DGAs encouraged Americans to limit added sugars to less than 10 percent of calories per day. “More consumers want products with no more than 10 g of sugar per serving, and they’d prefer levels be in the single digits,” Lowry said.

the emphasis on health and wellness extends to the flavors and seasonings in the products.

“We are seeing a growing interest in savory snacks, especially in categories that used to be predominately sweet, like energy and snack bars,” Novotny said. “Our naturally flavor-infused and smoked salts are really on-trend right now and elevate the flavor profiles of snacks while maintaining a clean label.”

SaltWorks offers a wide range of pure sea salts and naturally smoked and flavored salts in grain sizes ideal for food manufacturing, production and service applications. The company’s proprietary processes include accurate and precise sieving, ensuring uniform grains in a variety of sizes



### Natural sea salts allow for a clean-label solution to reducing sodium because they haven’t been heavily or chemically processed and offer a stronger impact of pure salty flavor.

When it comes to formulation, one of the biggest challenges is keeping the ingredient list small, yet still maintaining a snack’s taste and quality throughout its shelf life. Julie Schuette, food scientist, Cargill Salt, said the key is relying on ingredients like salt that are functional and stable over time. Schuette noted an increasing number of snack manufacturers opting for sea salt in crackers and chips as a way to differentiate on the label. “We found that by altering the structure of the salt crystal, it’s possible to reduce sodium levels yet still deliver the same salty taste,” she said. “Alberger® salt flakes have a hollow pyramid-shape and tiny, multifaceted crystals that provide a larger surface area and lower bulk density. This unique crystal structure enables Alberger salt flakes to deliver a more intense burst of salty taste than traditional cube-shaped crystals.”

Naomi Novotny, president, SaltWorks Inc., said natural sea salts allow for a clean-label solution to reducing sodium because they haven’t been heavily or chemically processed and offer a stronger impact of pure salty flavor. She also noted

that are all-natural and never chemically processed.

The company’s Salish® Alderwood smoked salt adds a rich, smoky flavor to roasted nut mixes, frozen snacks or salmon jerky; Fusion® Black Truffle Salt is a popular flavor for dusting popcorn; and Sriracha Salt is very on-trend and suitable for everything from inclusion in sweet-and-spicy snack mixes to topping chocolate bars and frozen savory snacks.

The company’s pure, all-natural sea salts, such as Pure Ocean® Premium Atlantic Sea Salt, are available in a range of grain sizes from powder to coarse. Powder grain has a soft, velvety texture similar to baking flour that is ideal for foods that need even coating and adhesion, such as tortilla or veggie chips and popcorn.

“Our snack grain size is perfect for food applications that call for a slightly more granular texture because it allows for adhesion plus the visual appeal of salt crystals. We also offer all-natural wax encapsulation for frozen foods, which helps the salt crystals retain their texture when used topically on products going from frozen to thawed,” Novotny said.

