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## NATURALLY NUTRITIOUS

By Donna Berry, Contributing Editor

Safety and nutritional adequacy aside, a diet based on raw foods is not realistic or sustainable when trying to feed the world. Yet, consumers' interest in "natural" and "minimally processed" foods continues to heavily influence product developers' selection of ingredients. Many formulators are turning to "real food" ingredients that feed consumers' back-to-nature hunger and still provide the functionality and economic edge required to succeed in the crowded marketplace.

For example, Jim Breen, president and founder, Live Better Brands LLC, Smithtown, NY, says: "It all started with a simple vision to create a better snack. We wondered, wouldn't it be great to go back to a time when the food we ate was actually nutritious and good for you? We decided to do just that by including sprouted, also known as germinated, grains, seeds and beans into tortilla chips. Nutritionists and naturalists have been touting the benefits of sprouting for years because sprouting unlocks all the 'good' that is inherent in grains, seeds and beans and brings them back to life, nutritionally speaking. All of the proteins, oils, starches and vitamins are now bioavailable for human digestion, resulting in better nutritional absorption." The company includes sprouted flaxseed, chia seeds, quinoa, black beans, broccoli and daikon radish seeds in its tortilla chips.

### Processing boundaries

Many consumers believe that processing of foods and ingredients wipes out inherent nutrition, but what are the limits of acceptable processing? After all, manually germinating grains, seeds and beans is a form of processing.

"The concept of minimal processing varies greatly, especially among consumers," says Sharon Walbert, assistant vice president-technology leader, Cargill, Inc., Minneapolis. "Food manufacturers must understand their core customers' expectations and decide what fits best for their brands. From a technology point of view, advances in physical and thermal processing now allow us to produce products that can be described as minimally processed because they use less invasive production methods."

Kevin Holland, product developer, Tree Top, Inc., Selah, WA, adds: "As a whole, the food industry is always looking for better ways to process agricultural products. Better processing translates to better flavor, color, shelf life and yield. And, ultimately, food companies are able to offer more delicious foods at competitive prices. I think consumers view 'minimally processed' as something that has not been cooked to death or has a million ingredients. This has resulted in food manufacturers simplifying their ingredient labels and looking for alternative processing and packaging technologies."

### Back-to-nature options

Probably the most common approach to this back-to-nature formulating is the increased use of whole grains, along with the addition of other plant-based ingredients, such as beans, nuts and seeds. For example, aggressive consumer-education campaigns have made Americans aware of the many nutritional benefits of consuming flaxseed. As a result, this grain is showing up in all types of applications, from breakfast cereal to the breading on chicken nuggets.

Approximately 40% fat, 28% dietary fiber, 21% (gluten-free) protein, 4% ash and 6% carbohydrate, flaxseed inclusion in many applications often results in front-of-package content claims for omega-3 fatty acids. This is because the seed's oil contains about 73% polyunsaturated fatty acids (PUFA), 18% monounsaturated fatty acids and 9% saturated fatty acids, with the PUFA portion being more than half of the omega-3 alpha-linolenic acid (ALA). Fiber content claims are also quite common, as flaxseed has a unique fiber profile of containing almost equal amounts of soluble and insoluble fiber.

Flaxseed is also rich in the phytoestrogen lignan, containing 75 to 100 times more than any other plant source. Lignans have an effect on hormone metabolism in humans; in particular, they have been shown to help balance hormone levels, such as estrogen, in the body. They've been found to help reduce symptoms of menopause, making flaxseed-containing foods an attractive product for menopausal women who prefer to receive wellness benefits from foods rather than pills.

One of the greatest challenges with processing raw flaxseed into a useable ingredient is making the lignans and ALA bioavailable to the consumer, while at the same time preventing the oil from going rancid. "To accomplish this, we purchase a 99.9%-pure whole flaxseed from eastern and western Canada, and we shell it by a patented mechanical process," says Doreen VandenTillaart, vice president of operations, Natunola Health, Winchester, Ontario. "Our process does not disrupt the fat in the kernel, so our products are very stable. We offer a flax ingredient with three different percentages of kernel—25, 50 and 70—with the remaining percentage as the hull. The higher the percentage of kernel, the greater is the concentration of ALA. We also have a product that is almost entirely pure flax hull, where the flax lignans are found."

Rachel Zemser, food science consultant, California Walnut Board, Folsom, CA, explains that walnuts are the only nut source a source of ALA. "Walnuts can also help boost protein levels in a finished product," she says. "Marketers should take advantage of the natural, better-for-you components of walnuts and flag them as much as possible. Not all consumers are aware of all their benefits, and a reminder in the form of a legitimate marketing claim is a great way to help consumers understand the value of walnuts in a product."

### **From the garden**

Formulating with fruits and vegetables is another way to boost the nutrient profile of all types of foods. "All fruits are, by default, naturally nutritious, as they contain essentially no fat and are good sources of antioxidants, fiber and other nutrients," says Doug Webster, director of product development, Tree Top. "We offer individually quick frozen (IQF) diced fruit, purées, juices, fruit preps and dried fruit, with selection depending on the moisture and water activity requirements of your application. In addition to their inherent nutrition, in some applications, we can add other functional ingredients to boost their nutrition, creating 'fruits with benefits'."

Holland adds: "The form of fruit used is typically application driven, but we are always looking for new ways to incorporate fruit ingredients into foods and beverages. After all, most adults are not consuming the recommended servings of fruits and vegetables, and are looking for additional ways to meet their daily needs.

"In addition to nutrition, fruit can naturally add color and texture to many foods. Purées can even take the place of fat in some baking applications," Holland continues. "Manufacturers need to communicate that their product contains fruit, and they may also want to advertise fruit servings, if possible."

The addition of fruit speaks for itself. "You don't need to explain what the ORAC value is on product labels," says Webster. "Consumers know and trust that the addition of fruit to a product improves its healthfulness. Sometimes specific fruits are used because they are known for certain benefits."

Consumer interest in so-called superfruits is high, leading to formulation with more exotic fruits, like pomegranate, açai and goji. But product designers can look closer to home to take advantage of the natural health benefits and flavor appeal of more-recognizable, but equally nutritious fruits. The natural antioxidants in fruits like apples (including quercetin, catechin, phloridzin and chlorogenic acid) and blueberries (including anthocyanins, flavonols, procyanidins and chlorogenic acid) can underscore the connection between natural and nutrition.

One fruit receiving increased recognition in nutritional circles is tart cherries, which are high in antioxidants. "According to a recent study, tart cherries have among the highest levels of antioxidants of other superfoods, ranking cherries 14 in the top 50 foods for highest antioxidant content per serving size—surpassing well-known leaders such as red wine, prunes, dark chocolate and orange juice," says Wendy Bazilian, author of *The Superfoods RX Diet* and a

spokesperson for the Cherry Marketing Institute, Dewitt, MI. "They have a unique nutrient profile, including essential nutrients such as vitamin A and potassium. Potassium is considered a nutrient of concern according to the 2010 Dietary Guidelines for Americans because, as a population, we are just not getting enough of this important nutrient." Product designers can assist by including tart cherries in products ranging from granola bars to barbecue sauce.

"Tart cherries are a versatile 'real' food ingredient, as they come in many forms, including dried, frozen, juice and juice concentrate. They can add a unique sweet-tart flavor to all types of foods," Bazilian says. "Frozen is perfect for baked foods. Juice and juice concentrates work well in sauces, marinades and dressings, while dried cherries complement most snack foods and sweet treats."

Jeannie Curry-Swedberg, director of business development, Tree Top, says there is definitely a trend toward flagging fruit and vegetable content on product packaging, which indirectly communicates that the product is naturally nutritious. "We are seeing more companies promoting the number of individual fruits used in making a product. One example is Bolthouse Farms 50/50 Tropical Juice, which is half fruit juice and half vegetable juice. Labels convey that each 32-oz. bottle contains four fruit and four vegetable servings, specifically three oranges, 2/3 passion fruit, one guava, 12 1/2 carrots, 2 1/3 pears and 2 3/4 apples. Innocent Brand in the United Kingdom has used this product promotional tactic for years. They are letting the naturally healthy fruit and vegetables speak for themselves."

In fact, promoting the addition of vegetables, oftentimes unique varieties, to packaged and prepared foods is a booming trend, according to the "Vegetables & Sides: Culinary Trend Mapping Report" recently released by market research publisher Packaged Facts, Rockville, MD, and the Center for Culinary Development (CCD), San Francisco.

"The explosion of farmers' markets with new and different varieties of vegetables has raised American consumers' vegetable IQs and influenced their lifestyles by encouraging them to add new vegetable-centric products to their diets," says Kimberly Egan, CEO, CCD. "And not just as sides, but as green breakfast smoothies, meatless entrées and even desserts made with vegetables," all concepts that extend vegetable consumption into new dayparts.

For example, bakers are turning to vegetables for their unique flavor profiles and oftentimes mild sweetness for applications ranging far beyond standards such as carrot cake and zucchini bread. And sea vegetables, such as nori, dulse and kelp, are increasingly being used in packaged foods as more Americans learn to appreciate their distinctive flavors and nutritional powers. The salty, briny taste of sea vegetables can provide umami flavor to dishes and can be used as a seasoning, ground and added to spice rubs, spice blends, vegetable coating batters, rice dishes and stir fries.

### **Sweet discretion**

Sometimes formulators choose non-characterizing naturally nutritious ingredients to improve the Nutrition Facts, but only mention it on the ingredient statement. For example, in the world of sweeteners, there is a lot of front-of-package flagging of which sweeteners a product does not contain, but seldom any mention of which ones are used. Sometimes consumers could benefit from this knowledge, especially when the sweetener provides nutrition in addition to sweetness.

"Malt extracts can be thought of as the original grain-based sweetener," says Judie Giebel, technical services representative, Briess Malt & Ingredients Co., Chilton, WI. "Long before the advent of acid conversion, genetically modified enzymes and corn syrups, grain-based sweeteners were created for bakers and food processors using malted grains and water.

"Produced using a variant of the brewing process, malt extracts are manufactured by mixing malted grains with water. This allows the enzymes to break down the starch and proteinaceous material of the malted seed," says Giebel. "Insoluble fiber is removed, and the resulting sugary liquid, instead of being fermented into beer, is concentrated to make a viscous, stable liquid sweetener or is dried to make a powder.

"Due to the type of enzymes naturally present in malt, malt extracts have carbohydrate profiles very similar to high-maltose syrup. Because they are made from a whole grain, they also contain about 6% protein (8% on dry basis), as well as an abundance of free amino acids, vitamins and minerals," Giebel adds. "These constituents, which are not present in starch-based syrups, increase the nutritional value of malt extract as a nutritive sweetener and account for its use as a yeast food and browning agent."

Giebel explains that malt ingredients are whole grains. Specifically, diastatic malts are sprouted whole grains. The sprouting activates the inherent enzymes, which enables the malts to function as natural dough conditioners, improving flavor, crumb and browning in baked goods. "These same malts can be dried further or roasted to create nondiastatic malts," she says. "This means there is no enzyme activity. These malts are used for natural color—from warm golden tones to very dark, almost black hues. The nondiastatic malt also contributes to flavor, from a rich biscuit taste to intense coffee."

### **Tricks of the trade**

When it comes to baked goods, select leavening agents can also discretely contribute nutrition at the same time they make the baked good rise. For example, calcium phosphates provide the bone-building mineral calcium while potassium bicarbonate delivers a nutrient of concern, as indicated by Bazilian.

Many bakers rely on egg products for various functions ranging from leavening and emulsification to foaming and color. What they don't typically realize is that eggs contain many nutrients in levels that can improve the nutrition profile of a product formulation. And because consumers use and enjoy eggs in the home, most consumers understand that egg ingredients provide nutrition.

"The egg is one of the few natural sources of vitamin D, in addition to lutein, zeaxanthin, choline and other vitamins and minerals," says Mitch Kanter, executive director, Egg Nutrition Center, Park Ridge, IL. "Although most of the egg's protein is contained in the white, the yolk provides the majority of the vitamins and minerals found in an egg, including most of the choline and vitamin B12. One large egg—about 50 grams worth—provides 6 grams of highly digestible protein.

"Depending upon the functionality a baker or food manufacturer requires, the formulator can choose from whole egg, egg white or egg yolk ingredients," Kanter says. "Egg functionality, and its nutritional qualities, work hand in hand, therefore no special steps are required on the part of the manufacturer to enjoy both functionality and an improved nutritional profile in a finished product that includes egg ingredients."

Dairy ingredients such as nonfat dry milk, lactose and whey have also long been used in many bakery applications as non-characterizing ingredients that contribute to structure and texture, as well as nutrition in terms of high-quality protein, vitamins and minerals, in particular calcium. These ingredients can naturally contribute to the nutrition profile of all types of foods, from bars to soups. Other more characterizing dairy ingredients, such as cheese and yogurt, are increasingly being incorporated into product formulas and flagged on front-of-package labels.

"Today's consumers are increasingly looking for familiar ingredients that they have always known are good for them," Walbert says. "Our challenge is to formulate them to be functional, safe and good tasting."

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