



# The Future of Food is Now

## Trends in functional and sustainable ingredients

■ **Donna Berry** *Product Development Editor*

**S**ome might say the terms functional and sustainable have nothing in common. On the contrary, functional ingredients that address health and wellness contribute to the sustainability of mankind. This is why the two topics have been combined in *Dairy Foods'* annual functional ingredient forecast.

Functional ingredients, which when added to milk or another dairy base such as cheese, ice cream or yogurt, have the ability to positively contribute to the health and wellness of today's consumers, as well as future generations. Compared to other food and beverage matrices, dairy foods remain a choice delivery vehicle for many functional ingredients because dairy's shorter, and oftentimes refrigerated or frozen shelf life, translates to functional ingredients that remain efficacious until the product expires.

Further, when those ingredients are produced utilizing the three primary components of sustainability — social responsibility (how a business impacts employees, customers and the communities in which it operates), ecological integrity (how a company's operations impact the world and its resources) and economic stability (how a company makes, spends and saves money) — marketers can relay this information to consumers on product packaging and web sites. The very progressive marketer will likely use numerous forms of social media.

For example, Wisdom Natural Brands, Gilbert, Ariz., makers of the consumer-packaged stevia-based SweetLeaf Sweetener, touts on its Facebook page the fact that it is committed to utiliz-

ing "green" methods in all agricultural and manufacturing operations. "At Wisdom Natural Brands, we believe in not only keeping the body healthy, but also the environment. When searching for a stevia farm to partner with for our SweetLeaf Sweetener, we turned to South America. I met directly with native farmers of several South American countries and contracted them to grow high-quality stevia that we could in turn use for our stevia sweetener," says Jim May, founder of the company. "Providing the farmers with an incentive to grow crops bettered the lives of everyone involved, from the farmer to the consumer. Our products allow us to provide good people with steady work and in turn, we can provide consumers with high-quality stevia leaves, which contain important nutrients that are vital to the function and well-being of the human body."

### Many facets of sustainability

There's no argument that consumers' sustainability consciousness is growing. Companies are increasingly greening their business practices, operations, and products and services. Suppliers and manufacturers alike are trying to better understand what consumers are looking for and if consumers will reward them for their sustainability efforts.

This, of course, can be challenging, as sustainability is a process, not an end result. No individual product or company is fully sustainable, according to Gene Kahn, global sustainability officer, General Mills Inc., Minneapolis, founder of pioneering food

company Cascadian Farm Organic, which was acquired by General Mills. Rather, "Sustainability is a continuum of improvement activities."

USDA estimates that for every 10 pounds of food sold to a consumer, 3 pounds of food waste and 3.5 pounds of packaging waste are produced. Any process that reduces this waste, which can occur at any point in the production, distribution and usage continuum, deserves recognition.

Because the issue of sustainability is so multi-faceted, Kahn recommends that a company seeking to embrace sustainability start with the aspect of the issue that is most relevant to that particular company. For example, for General Mills, manufacturers of Yoplait yogurt, the most relevant aspect is human health. Because of the nature of its product portfolio, that is the area "where we have the greatest opportunity to affect change," says Kahn.

### Three Primary Components of Sustainability

**Social Responsibility:** How a business impacts employees, customers and the communities in which it operates

**Ecological Integrity:** How a company's operations impact the world and its resources

**Economic Stability:** How a company makes, spends and saves money

For example, the buzz phrase in General Mills' 2009 Corporate Social Responsibility report is "Nourishing lives." To do this, the company has identified three consumer-friendly goals: To make life healthier, to make lives easier with more convenient foods and to make lives richer with foods that contribute to the living experience.

Waterbury, Vt.-based Ben & Jerry's, a Unilever company, has a product mission statement that promotes "business practices that respect the Earth and the environment." This is exemplified in the company's February announcement of its commitment to go fully Fair Trade across its entire global flavor portfolio. From Cherry Garcia to Chocolate Fudge Brownie, all of the flavors in all of the countries where Ben & Jerry's frozen desserts are sold will be converted to Fair Trade Certified ingredients by the end of 2013.

Ben & Jerry's Fair Trade commitment means that every ingredient that can be sourced Fair Trade Certified, now or in

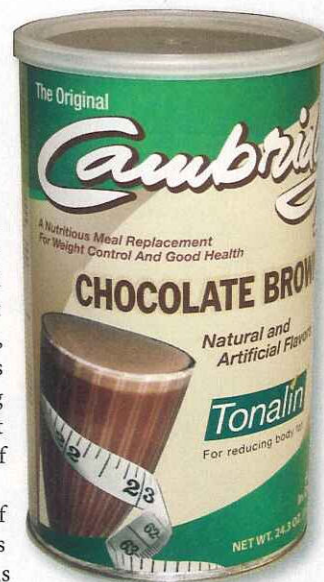
■ New Cambridge Diet brand dairy-based meal replacement shakes include conjugated linoleic acid, which is said to help reduce body fat.

the future, is Fair Trade Certified. Globally, this involves converting up to 121 different chunks and swirls, working across 11 different ingredients such as cocoa, banana, vanilla and other flavorings, fruits and nuts. It also means working with Fair Trade cooperatives that total a combined membership of more than 27,000 farmers.

Rob Cameron, chief executive of Fairtrade Labeling Organizations International, says, "Congratulations to Ben & Jerry's on the scale and the depth of this commitment to take their whole range Fair Trade. Tackling poverty and sustainable agriculture through trade may not be easy but it is always worth it, and Ben & Jerry's has demonstrated real leadership in laying out this long-term ambition to engage with smallholders, who grow nuts, bananas, vanilla, cocoa and other Fair Trade-certified ingredients."

Farmers selling Fair Trade products earn a better income, which allows them to stay on their land. Fair Trade premiums also allow for reinvestment in their farms, their families, their communities and their future. Fair Trade means that certified farmers are using environmentally sound practices to grow and harvest their crops in a sustainable way.

Fair Trade, along with local sourcing and organic, are the most common descriptors associated with sustainable ingredients. However, such practices are not always an option with innovative, cutting-edge ingredients, such as those described as functional. For example, some functional ingredients are isolated and purified compounds made using high-energy processes. Others can only be sourced from distant regions of the world. Some have simply not been produced under organic conditions...yet. Nevertheless, ingredient suppliers can still explore a wide variety of sustainable practices that complement their process.



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## Rich Rules in Nutrient Content Claims

According to an online survey of American consumers, the label claim of a food being rich in a specific nutrient resonates stronger than simply saying the food contains added amounts of the nutrient. For example, foods labeled as “rich in antioxidants” are much more likely to be consumed “very frequently” or “somewhat frequently” (40%) by American consumers compared to foods labeled as “antioxidants added” (25%). These data are based on a representative sample of 16,392 U.S. adult respondents.

“Our findings suggest that more Americans frequently consume products labeled ‘rich in’ these ingredients, compared to products that have the same ingredients ‘added.’ This is likely due to the perception that foods rich in an ingredient are more natural and less processed, compared to foods that have these ingredients added to them during the manufacturing process,” says Diane Brewton, senior vice president of the market intelligence group at Decision Analyst, the Dallas-Fort Worth-based market research firm. “Consumer perceptions and beliefs about ingredients contained in their foods, as well as nutritional information on food packaging, are important factors driving their purchase behavior. Understanding consumer knowledge and beliefs is crucial for food marketers, as this helps them effectively highlight healthful, or even

‘magic,’ product ingredients in messaging and packaging claims.”

The nutrient content claim of “rich in” is defined by FDA as delivering 20% or more of the Daily Value of the specific nutrient. The descriptor is synonymous with “high in” or “excellent source of.” When something is labeled as “added,” this is considered by FDA as a relative nutrient content claim meaning 10% more of the required dairy intake (RDI) or daily reference value (DRV) of a nutrient than what would be typically found in that food. The term “added” is synonymous with “fortified,” “enriched,” “extra” and “plus” labeling terms. ■

### Percent of American Consumers Who Frequently Consume Products Described As...

- Rich in antioxidants: 40%
- Antioxidants added: 25%
- Rich in omega-3: 27%
- Omega-3 added: 19%
- Rich in iron: 25%
- Iron added: 15%

Source: Decision Analyst  
n = 16,392



For example, when CROPP Cooperative, LaFarge, Wis., decided to fortify its Organic Valley milk with omega-3 fatty acids, the company sought a partner in line with its mission of environmental responsibility and sustainability. In March, the cooperative introduced its docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) milk line made with omega-3 fatty acids sourced from wild fish, sardines and anchovies caught off the shores of Peru. The crude fish oil is obtained from areas where the local government closely monitors and highly regulates the fishing industry to prevent over-fishing...an effort that qualifies as a sustainable process.

The organic omega-3 milk category, which until now has been comprised of DHA-only products, grew 22% in 2009, according to CROPP. In fact, the omega-3/DHA segment now accounts for a 10% — and rising — dollar share of the organic branded milk category.

“When researchers polled consumers on what nutrients they feel are lacking in their diets, the top response was omega-3s,” says Eric Newman, vice president of sales for Organic Valley, “and according to research we’ve conducted, 65% of consumers say they would buy omega-3 milk. There is an overwhelming desire for this milk. We are proud that our new product will do more than any other milk on the market to boost omega-3 intakes, and that we have found a safe and sustainable natural source for the omega-3s added to these products.”

### Top-10 functional ingredients

Dairy Foods identified 10 functional ingredient categories that are driving innovation. One of them, as Organic Valley showcases in its recent milk introduction, is omega-3 fatty acids, which are discussed in more depth in this month’s Wellness Watch on cognitive health (p. 64). Descriptions of the other nine follow.

#### Conjugated linoleic acid

Conjugated linoleic acid (CLA) is a fatty acid naturally present in cows milk and certain animal meats; however, typically not at levels high enough for humans to reap the health benefits asso-

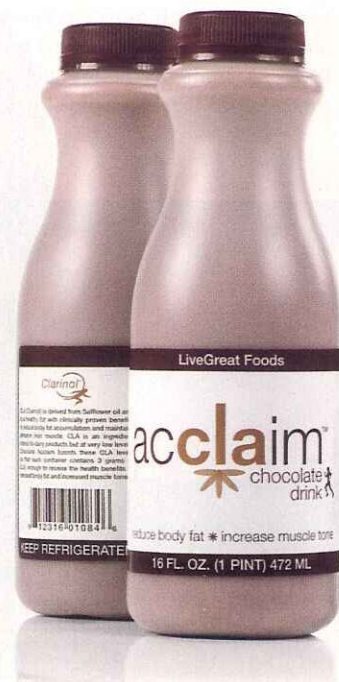
ciated with their consumption. This is partially due to changes in the Western diet, where average intake of CLA has fallen as a result of consuming mostly fat-free and low-fat dairy products, as well as leaner cuts of meat. The benefits associated with consuming efficacious levels of CLA include a reduction in body fat and increased lean muscle mass.

Since July 2008, CLA has been generally recognized as safe (GRAS) for several dairy applications, including fluid milk, yogurt and meal replacement beverages. Just this year, CLA has started appearing in commercially produced dairy foods. Still in its infancy, the CLA ingredient market is forecast to reach revenues of \$109.9 million by 2013, according to a 2007 Frost & Sullivan report.

#### Fiber

Fiber is a well-recognized food component. In the past five to 10 years, fiber has become an identifiable food ingredient that consumers understand. However, the only similarity that all fiber ingredients have is that they are not digested by the body. Functional benefits

■ **Acclaim** is a first-of-its-kind refrigerated chocolate drink that has all the benefits of chocolate milk plus the additional health benefits of conjugated linoleic acid. It is sold exclusively on the University of Wisconsin campus in Madison where the ingredient was extensively studied during the past 20 years.



differ from fiber to fiber; thus, formulators must work closely with suppliers to identify what benefits they want to tout on product applications. If it's only fiber content, a less expensive, commodity fiber might be the best choice. If heart health is the goal, only FDA-specified fiber ingredients (and established amounts) can make such a claim. For the most part, dairy foods formulators are taking the fiber content route, as fiber is an ingredient most Americans need to increase in their diet.

In 2002, the Institute of Medicine (IOM) established an Adequate Intake (AI) level for fiber as part of the Dietary Reference Intake (DRIs) for macronutrients. The AIs for total fiber are based on amounts that have been observed to protect against heart disease. The IOM recommends that people of all ages consume 14 grams of fiber for each 1,000 calories.

Most Americans consume about half the amount of fiber recommended by IOM, with nine out of 10 not getting the recommended amounts of fiber for their age and gender, according to Washington, D.C.-based International Food Information Council (IFIC). This is concerning to medical and nutritional professionals, as scientific evidence shows a link between consuming a high-fiber diet and an array of health and wellness matters, including reducing the risk of heart disease, preventing cancer, managing diabetes, improving digestive health and weight management.

Numerous studies have been published in the past year or so to reinforce fiber's role in the satiety-focused approach to weight management. A study published in the *Journal of British Nutrition* (October 2009) reported that adding a specific resistant starch to breakfast and lunch may cut calorie consumption over a 24-hour period by an average of 321 calories. In a study published in *Phytotherapy Research* (April 2009), researchers reported that obese subjects had increased feelings of satiety after consuming 8 grams of a specific fenugreek-derived fiber during breakfast.

In 2009, the functional dairy foods segment posted \$1.8 billion in sales, according to *Nutrition Business Journal*, which reflects a 2% increase from 2008.

### Green tea

Green tea, renowned for its powerful antioxidant and disease-fighting properties, has been found to assist with eye health. A new study, the first documenting how the lens, retina and other eye tissues absorb these substances, opens the possibility that green tea may protect against glaucoma and other common eye diseases. Glaucoma is a disease in which the optic nerve is damaged, leading to progressive, irreversible loss of vision.

Chi Pui Pang, department of ophthalmology and visual sciences, Chinese University of Hong Kong, and colleagues point out that the so-called green tea "catechins" have been among a number of antioxidants thought capable of protecting the eye. Those include vitamin C, vitamin E, lutein and zeaxanthin.

Until now, however, nobody knew if the catechins in green tea actually passed from the stomach and gastrointestinal tract into the tissues of the eye. Pang and his colleagues resolved that uncertainty in experiments with lab rats that drank green tea, said a release of the American Chemical Society (ACS). Analysis of eye tissues showed beyond a doubt that eye structures absorbed significant amounts of individual catechins.

The effects of green tea catechins in reducing harmful oxidative stress in the eye lasted for up to 20 hours. "Our results indicate



■ A glass of new Organic Valley omega-3 enhanced milk features more omega-3s per serving than any other organic milk on the market, according to the company. Further, its all-natural omega-3 fatty acids are sourced from sustainably harvested fish.

that green tea consumption could benefit the eye against oxidative stress," the study concludes. These findings were published in the ACS' bi-weekly *Journal of Agricultural and Food Chemistry* (Feb. 10, 2010).

Lifeway Foods, Morton Grove, Ill., recently launched what it describes as its greenest product ever. New Green Kefir with Phytoboost contains all the immunity-boosting benefits of probiotic-rich kefir in a great-tasting fruit-flavored cultured milk smoothie. It packs a powerful nutritional punch with Lifeway's proprietary blend of Phytoboost phytonutrients that deliver the disease-fighting antioxidant power of 10 green vegetables plus green tea extract in a single serving.

### Probiotics

Speaking of probiotics, the European Food Safety Authority may have rejected a number of probiotic health claims during the past year, but that has not prevented everyone and anyone in the States from enriching their foods and beverages with these beneficial bacteria.

Just like fiber, all bacteria are not created equal, and only a handful are recognized as probiotics by industry and academic authorities. Formulators are encouraged to ask suppliers for clinical documentation supporting a bacteria strain's probiotic status prior to touting claims that may not be properly substantiated.

The Yakult Co., Torrance, Calif., has created an online resource ([www.yakultusaprobiotics.com](http://www.yakultusaprobiotics.com)) to help address the scientific community's surging interest in substantiated evidence for the efficacy of probiotics and to educate about its own proprietary strain. The company is recognized as the world's pioneer of probiotics, having successfully cultured its exclusive strain in 1930 and producing the probiotic dairy drink Yakult in 1935, which is now enjoyed by 28 million loyal consumers around the world daily.

"Healthcare professionals often ask us: How is it that your probiotic strain is so powerful?" says Yakult U.S.A. Senior Science Manager Hideyuki Shibata. "Our founder, Minoru Shirota, studied thousands of bacteria, selected one amongst the strongest, and used 8 billion of them to make the Yakult drink. Today that probiotic, *Lactobacillus casei Shirota*, has more than 100 clinical studies demonstrating various potential benefits."

The Web site is password protected and requires free registration so that only serious probiotic researchers may gain access to the clinical data. "While we are confident in our research findings, we do not want the general population misinterpreting the data," he adds.

### Resveratrol

Discovered more than 50 years ago, resveratrol is produced naturally as a defense

mechanism against environmental stress by more than 70 species of plants. The popularity of resveratrol stems from its abundance in grapevines (*Vitis vinifera*) used to make red wine.

Scientific data suggest that resveratrol, in combination with the flavonoids and other polyphenols found in grapes and produced during the fermentation that turns grape juice to red wine, is the basis

of what has become known as the French Paradox. This concept claims to explain the relatively high-saturated fat-laden diet of the French, yet their relatively low incidence and prevalence of cardiovascular disease, as compared to Americans.

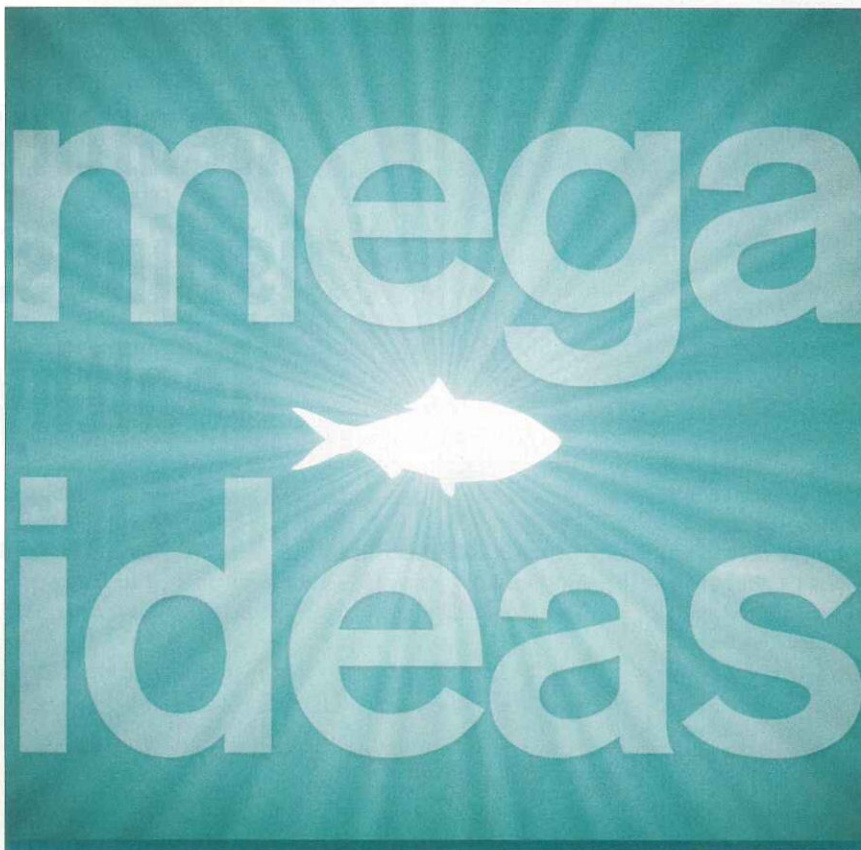
Although the resveratrol and other polyphenols in red wine are enthusiastically promoted for heart health, for the most part, one cannot consume enough via moderate consumption to reap any health benefits. This has led to the development of resveratrol ingredients, which can be added to foods and beverages.

Resveratrol-enriched foods and beverages have gained notoriety after positive coverage on major TV shows such as "60 Minutes," "Oprah" and a Barbara Walters special. A substantial amount of research validating a remarkable range of health benefits has been published, including resveratrol's ability to exhibit anti-inflammatory and antioxidant properties when consumed. This is believed to assist with delaying the onset of visible signs of aging.

### Superfruits

Superfruits are best described as an elite group of nutrient-rich fruits recognized as possessing beneficial health properties. The wild blueberry industry pioneered the world of superfruits in the mid-1990s. Though the term was not coined until the 21st century, the wild blueberry folks were the first to promote the antioxidants and oxygen radical absorbance capacity (ORAC) of fruit, according to John Sauve, managing partner, Swardlick Marketing Group, Portland, Maine, and a consultant to the Wild Blueberry Association. The term superfruit came around in 2004 when *Superfoods Rx* author Steven Pratt highlighted the antioxidant levels and anti-aging properties of blueberries in his bestseller. And though blueberries are most likely the best-known superfruit

■ Cardio Water is a pomegranate- and grape-flavored beverage that claims to have more resveratrol than 100 glasses of wine. Thanks to the use of a blend of erythritol, sugar and a stevia-based sweetener, each 12-ounce serving contains only 30 calories.



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## Nutritionally Enhanced Milk Beverages

NuCore Nutrition LLC, West Chester, Pa., markets OneSource. These unique milk-based aseptic beverages took three years to develop, according to Scott Fellows, president. Available in chocolate, strawberry and vanilla flavors, OneSource is distributed through select foodservice suppliers and via greater-Cincinnati retailers.

"OneSource, an enriched and fortified milk product, provides a rich source of a high-quality protein and more than one-third of the Daily Value (DV) for 16 essential vitamins and minerals," says Fellows. "Because OneSource begins with fresh, whole milk, it is not only high in protein, vitamins and minerals, it has a superior taste and milkshake consistency."



An 8-ounce serving delivers 50% of the Daily Value (DV) for vitamin D through fortification with a vitamin D3 ingredient. It is also fortified to provide 30% of the DV for all eight of the B vitamins.

"OneSource contains no plant-based proteins, such as soy," says Fellows. "OneSource contains 14 grams of high-quality, dairy-based protein for maximum lean muscle-mass building and retention. In addition to being classified as a

nutrient-rich food by USDA, its outstanding taste makes OneSource the number-one nutritional beverage choice for hundreds of hospitals, physicians and registered dietitians, as well as thousands of high school, professional and collegiate athletes and nutrition-conscious individuals of all ages." ■

today, the list of superfruits is constantly growing, and ranges from the obvious (apple), the increasingly more familiar (acai and pomegranate) to the exotic (maqui berry).

The maqui berry has been identified as the hot new superfruit for the decade. It is a dark, high-antioxidant fruit from the Patagonia region of South America and is said to have the highest level antioxidant rating of any fruit at 945 on the ORAC scale, which is three times the rating of acai.

### Vitamin B complex

Eight vitamins constitute what has become known as the vitamin B complex. These are essential nutrients for growth and development, and in recent years have become associated with providing vim, vigor and vitality during the aging process.

Specifically, vitamin B<sub>1</sub> (thiamin) and B<sub>2</sub> (riboflavin) help the body produce energy and affect enzymes that influence the muscles, nerves and heart. Vitamin B<sub>3</sub> (niacin) has a role in energy production in cells and in maintaining the health of the skin, nervous system and digestive system. Vitamin B<sub>5</sub> (pantothenic acid) influences normal growth and development. Vitamin B<sub>6</sub> (pyridoxine) helps the body break down protein and helps maintain the health of red blood cells, the nervous system and parts of the immune system, while vitamin B<sub>7</sub> (biotin) helps break down protein and carbohydrates and helps the body make hormones. Vitamin B<sub>9</sub> (folic acid) helps the cells in the body make and maintain DNA and is important in the production of red blood cells. And, last but not least, vitamin B<sub>12</sub> (cobalamin) plays a role in the body's growth and development. It also has a part in producing blood cells, the functions of the nervous system and how the body uses folic acid and carbohydrates.

### Vitamin D

A wave of recent studies continue to praise the sunshine vitamin, which has been linked to bone health, immune health, lower risk of several cancers, reduced heart attacks and fewer falls by the elderly, as well as other health and wellness benefits.

Vitamin D is also gaining a great deal of attention in the nutraceuticals business, as some believe that vitamin D helps maintain mineral levels in the skin, which in turn maintains the skin's moisture levels. Dryer skin is more easily damaged and less firm.

### Whey proteins

Consumers are looking for new, natural ways to curb their hunger and using whey protein as an ingredient in food and beverage products is a way to reach these consumers. Research supports the role of higher-protein diets in promoting satiety. This may help people manage hunger and cravings between meals or reduce the desire to reach for unnecessary snacks between meals.

Further, whey proteins are easily absorbed and used by the body. In combination with strength-training exercises, whey proteins can help boost the rate at which the body makes lean muscle.

Researchers at the Exercise Metabolism Research Group at the Department of Kinesiology, McMaster University in Ontario, Canada, have studied the role of protein quality on muscle-protein synthesis. They found evidence suggesting that the consumption of high-quality milk proteins such as whey protein, which contains a high level of leucine, can provide an anabolic advantage over other proteins in promoting muscle-protein synthesis. This is accentuated when combined with resistance exercise. (*Current Opinion in Clinical Nutrition & Metabolic Care*, January 2009)

Whey protein ingredients are readily incorporated into all types of dairy foods. Evanston, Ill.-based Tula Foods markets Better Whey of Life yogurt. The five-variety line — acai mixed berry, French vanilla, peach mango, plain and strawberry banana — features 15 grams to 17 grams of protein in each 6-ounce container. In addition to featuring whey protein as its predominate ingredient, the product is fortified with Vitamin D.

Health and wellness will continue to drive innovation in the dairy category. Remember to make every effort to choose ingredients produced in the most sustainable fashion. ■