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SERVING THE DIETARY SUPPLEMENT, FUNCTIONAL FOOD AND NUTRITIONAL BEVERAGE INDUSTRIES

What's Next in **Nutrition Bars?**

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Delivery Strategies In Transit



The days of bulky, chalky 'horse pills' are virtually over, along with the notion that gummies, chews and other fun delivery formats are reserved for kids.

By Sean Moloughney
Associate Editor

As nutraceutical products compete for shelf space, new delivery systems can offer a point of differentiation while also improving a product's efficacy and appealing to a broader group of consumers who can't or won't swallow tablets and capsules.

With improved science and technology, delivery formats have evolved to meet the growing demands of people who want good-tasting, convenient products that coincide with their current lifestyles.

As a result, manufacturers continue to launch a variety of foods and beverages fortified with health ingredients like omega 3s and probiotics, as well as dietary supplements available in formats that include chews, lozenges, gums, gummies, effervescent formulas, thin film strips, shots and gels, among others.

Omega 3s

With sales of omega 3 products at an all-time high, alongside recognition that the Western diet is generally deficient in

these essential fatty acids, consumers will continue to see new products in varying formats, beyond traditional soft gels.

Manufacturers and product developers have faced numerous obstacles when fortifying products with omega 3s, including oxidation. "The primary challenge is delivering an innovative and high quality product that does not have inconsequential amounts of EPA, DHA or other nutrients," said Tiffany Diehl, strategic projects manager, Nordic Naturals, Watsonville, CA. "It is important that unique dosage forms or combination products are not manufactured at the expense of concentration, taste, purity and freshness. Innovation in the manufacturing process becomes a critical part of addressing these challenges."

Perhaps exemplifying the progression of foods and beverages fortified with fish oil, in November of 2010 Renewal Laboratories, San Diego, CA, launched All Heart, an all-natural bottled tea that contains 250 mg of omega 3 fish oil. Available

in Sweetened and Unsweetened varieties, the beverage features the company's NatureFormed technology. The patent-pending process harnesses the natural power of molecular self-assembly to transform fish oil into stable, water-soluble microparticles without the use of chemical additives. The process eliminates the need for artificial emulsifiers or detergents, the company said.

Ms. Diehl noted that omega 3 powders and emulsified products have gained popularity in recent years, allowing for more products that appeal to different consumer groups. "Gummies are popular with chil-

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dren and we even see a few adults with a passion for them," she said. "With continuing education on the benefits of omega 3s, we will see a broader spectrum of consumers who are focused on the experience—taste, texture, convenience."

In 2010 Nordic Naturals introduced Nordic Omega 3 Gummy Worms—available in Strawberry flavor—which contain 56 mg of EPA + DHA per worm. The company has also looked to combine omega 3s with other nutrients, launching Omega 3 Effervescent, a water-soluble, Orange-flavor drink mix that contains 500 mg of EPA and DHA, as well as 1200 IU of vitamin D3 per serving. The company claims its new delivery system allows for faster absorption of omega 3s.

Ms. Diehl said she believes new delivery technologies for omega 3s such as these are sustainable, but likely won't overshadow the more traditional soft gel. "New delivery methods are moving away from the idea of 'traditional' dietary supplements," she added. "Enjoying an orange drink is a much different concept than taking two to four soft gels per day."

Gummies & Effervescent Formulas

As research continues to underline the importance of omega 3s for children, gummies that contain omega 3 fatty acids, and other nutrients, have become an attractive alternative to hard-to-swallow pills or capsules.

Olivia Sant'Angelo, market analyst with the Netherlands-based Innova Market Insights, noted that gummies offer "a more natural delivery system for children, whereby they can enjoy the taste of a gummy and the multivitamin boost of a supplement."

For example, Coromega, Vista, CA, expanded its line of omega 3 supplements in 2010 with Coromega Kids Omega 3 Gummy Fruits. Each serving of two gummies contains 50 mg of DHA and 10 mg of EPA. The product is available in Orange, Lemon and Strawberry Banana flavors. Also capitalizing on the growing popularity of vitamin D, the company has unveiled Coromega Omega 3 + Vitamin D. This uniquely emulsified supplement

offers the same amounts of 230 mg of DHA and 350 mg of EPA as the company's traditional Omega 3 Squeeze, and also includes 1000 IU of vitamin D3 per pouch, available in Tropical Orange flavor.

Natural Dynamix, Los Angeles, CA, released its Gummy Cuties line of children's gummy vitamins in 2010. Gummy Cuties Multi Vitamin blends 11 essential nutrients and vitamins to help kids stay healthy. Gummy Cuties Calcium with Vitamin D helps to build strong bones and teeth and Gummy Cuties Omega 3 contains EPA and DHA.

But gummies are no longer reserved for children. Natural Dynamix has also launched Fiber Adult Gummies, which contain 4 grams of fiber per serving, as well as Calcium Adult Gummies.

In addition to a successful line of gummy products for children, Hero Nutritionals, San Clemente, CA, also offers Slice of Life Gummy Vitamins for Adults, available in a spectrum of formulas, including Multi-Vitamin + Lycopene, Vitamin C + Pomegranate, Vitamin B12 Energy, CoQ10, Omega 3-6-9 Fish Free and Vitamin D3.

Made popular by products like Airborne and Emergen-C, effervescent formulas offer a quick and convenient means of obtaining nutrients by simply dropping a tablet or powder into water.

Lisa Lent, CEO of Vitalah, Watsonville, CA, which created Oxylent, an effervescent multivitamin/mineral powder, said her company's product offers numerous benefits to all types of consumers. "First and foremost, the powder form improves the bioavailability of vitamins and minerals because powder form supplements are produced with less processing of the ingredients (including avoiding excessive heat and binder ingredients such as cellulose); less time elapses between blending and processing, which reduces the exposure of the ingredients to air; and the powder form is better absorbed by the body because it does not need to be broken down by stomach acids to be absorbed in the small intestine—an advantage especially important for people with digestive difficulties."

Effervescent delivery systems are also a convenient way for children to obtain the

essential vitamins and minerals they need, she added, "as well as a useful option for an aging population that finds swallowing and absorption more challenging."

Probiotics & Functional Foods

Convenience is integral to a product's success, according to Mike Bush, vice president of business development, Ganeden Biotech, Inc., Cleveland, OH, who said functional food companies are aiming to fortify products that people consume every day.

"In our consumer research we found that people don't want to add a new habit," he said. "There are already enough things they have to do in order to be healthy that are intrusive on their lifestyle. Our primary goal is to improve the quality of life for the consumer while at the same time not making them add new habits."

While the lion's share of probiotic products are drinkable and spoonable yogurts, these products don't appeal to every consumer. "If you're not a yogurt eater, it's hard to add a once-a-day or twice-a-day yogurt habit to your general lifestyle," Mr. Bush said. "But if you eat oatmeal every day, then we want to make sure there is a probiotic oatmeal available. We work hard at finding things that fit into the everyday, ordinary lifestyle of our consumers."

Ganeden has worked with companies such as Bigelow tea to offer a probiotic hot tea, as well as Raconto pasta and Heartland Sweeteners. The latter recently released Nevella, a low calorie sweetener with probiotics, which allows consumers to add probiotics to their own foods and beverages.

"On the supplement side, we're starting to see things like gummy bears coming out," Mr. Bush said, also noting growth in combination products, such as omega 3s with probiotics. "That's nice because they're both products you have to take every day. By combining them and stabilizing the probiotic in the omega 3 you get twice the bang for your buck. And consumers seem to like that. We're seeing a lot of neat things in the marketplace, from chocolate to Kombucha."

In the end, though, a delivery method

doesn't mean much without an efficacious product. "The most important thing, no matter what you put it in, is the ability to have an efficacious dose at the time the consumer takes the product. We do a lot of work with our customers to test a product after the manufacturing process, including shelf-life testing to ensure the consumer is getting what they pay for."

Shots

Meeting consumer demand for convenient products that work, 5-Hour Energy, which offers an alternative to larger energy drinks in a 2-oz. bottle that contains only 4 calories, helped to catapult the shot market into mainstream stardom.

Shot products, typically packaged in 2-4 oz. bottles (60-120 ml), are not limited to an energy platform, though many products have tried to capitalize on the success of 5-Hour Energy.

For example, Innova's Ms. Sant'Angelo said the Happy Planet line of shots in Canada is an innovative line of all-natural beverage shots that contain herbs and vitamins. "Happy Planet Shots, including Energy +, Immunity, Detox and Glow,

were formulated to address four specific occasions. The 75 ml Happy Planet Immunity Shot contains fucoidan, an algae that helps prevent the common cold and flu. Also added is echinacea, which has a long tradition as a cold fighter."

In the U.S., Lifeway Foods, Morton Grove, IL, launched BioKefir shots, which deliver probiotics in a 3.5-oz. package. Designed to support immunity, heart health and digestion, the product contains more than 20 billion units of live and active probiotic activity and is available in five varieties.

BioKefir for Immunity is offered in Pomegranate/Blueberry and Kiwi/Passion fruit. It also contains acerola and delivers 100% of the recommended daily value for vitamin C.

BioKefir for Heart Health is available in Blackberry and Black Cherry. It features grape concentrate as well as pomegranate, apple and green tea extracts that deliver antioxidants such as resveratrol.

BioKefir for Digestion, available in Vanilla flavor, balances the digestive ecosystem with a Lifeway probiotic formula designed to soothe upset stomachs, alleviate diarrhea and help regulate the

symptoms of irritable bowel syndrome (IBS) and other digestive ailments. Vanilla BioKefir is also an "excellent source" of fiber.

Thin Film Strips

Innova's Ms. Sant'Angelo said oral thin strips have been an emerging category for breath freshening during the last three or four years, but are currently evolving into other health platforms. "The category now also features products claiming to contain hunger cravings," she said, noting the U.K. product Slim Hunger Strips, from Healthmasters, which contains guarana seed extract.

John Tobin, president and CEO of NutraFood Nutrients, Inc., Pleasantville, NJ, which specializes in thin film technology, said his company's technology could be utilized in pharmaceutical, nutraceutical and cosmeceutical products, in oral strips and topical patches.

"We developed a technology that allows us to put a higher level of active ingredients onto thin strips," he said. "Most of the nutraceutical products on the market range from 5 mg to 30 mg of an active

'Breathable Vitamins' Set to Launch in the U.S.

Unique delivery system enhances bioavailability

Looking to revolutionize the delivery of micronutrients, Le Whif Vitamin has introduced a pill-free alternative to traditional vitamins utilizing a non-digestive process that enhances absorption through inhalation.

Inventor David Edwards, a Harvard University professor who pioneered inhalable insulin, said the idea originated from work he has done related to delivering drugs and vaccines to the lungs.

To develop Le Whif, London, U.K.-based Breathable Foods has worked in collaboration with Artscience Labs, an international network of laboratories founded by Dr. Edwards. "In 2007, during a lunch with a French chef, it occurred to me that the approach used until then to deliver drugs and vaccines to the lungs [could] be used to deliver food to the mouth," Mr. Edwards recalled. "Everything that we'd worked on over the years to avoid depositing aerosol in the mouth might be rethought to precisely deliver aerosol to the mouth—a kind of inhalable fork."

The first product, Le Whif Chocolate, launched in the spring of 2009, and the second, Le Whif Coffee, launched in the win-

ter of 2010. Both deliver food (chocolate and coffee) as tiny dry particles to the mouth, without the calories or the cup.

Each Le Whif Vitamin inhaler contains a full daily dose of the particular vitamins indicated. "Le Whif Vitamin delivers vitamins to the mouth, very simply," said Mr. Edwards. "There is no delivery to the lungs—assured by the size of the particles in Le Whif, which on average are in the 50-100 micron size range. Only particles less than 10 microns enter the lungs on respiration. There are decades of research demonstrating that powders of the kind delivered to consumers by Le Whif land in the mouth."

All ingredients are Generally Recognized As Safe (GRAS) for oral consumption, he added. Le Whif Vitamins are currently available in three flavors: Antioxidant Green Tea (vitamins C and E), Multivitamin Hibiscus Tea (vitamins A, B1, B2, B3 and B5) and Smart Wine Tea (vitamin D).

"The goal of avoiding pills in vitamin delivery is well recognized—and achieved today through sprays, gums, strips and other oral dosage forms," said Mr. Edwards. "It seemed to me that Le Whif might provide special benefits related to these existing approaches."

He discussed the general premise of "buccal" (or mouth) delivery of vitamins, alongside its advantages. "Delivery through the mouth, as opposed to through the gut, not only provides

ingredient. With our technology we can provide 250 mg of an active ingredient."

Mr. Tobin said this technology offers enormous appeal to the four out of 10 people around the world who are unable or unwilling to take pills or capsules. For example, small dosages of nutrients like vitamin D3 can be administered to infants. "We're also investigating doing some products for the senior market. Many people in elder care simply can't swallow pills," he said.

Overall, thin strips are "much more user friendly," according to Mr. Tobin, as they are extremely portable and don't need water. From a manufacturing standpoint, active ingredients on strips are also more bioavailable, as many nutrients are destroyed as they travel through the gastrointestinal tract.

Gums & Other Formats

When thinking about delivery systems, "form follows function," according to Joseph O'Neill, executive vice president of sales and marketing, BENEIO Inc., Morris Plains, NJ. "In other words, one needs to consider the occasion of use and the ob-

jective. Is it a product that should be consumed several times during the day? On the go? Do you want a look that is not too medical? In such cases, gum is definitely a delivery system of choice."

Mr. O'Neill divided gums into two types: traditionally manufactured and compressed gums. "Traditionally manufactured gums allow a variety of forms and packages and the use of many functional/active ingredients. Compressed gums are useful with temperature-sensitive active ingredients as they are based on a simple, dry compressing method."

In the future, Mr. O'Neill predicted that "convenience of consumption" would drive delivery systems, as well as portion packs. "Since gum tends to be a product for younger generations, it may be able to now make the jump into being the supplement or better 'added-value' delivery system, in addition to being the delivery system for dental care benefits."

Many other delivery formats allow companies to diversify their product portfolio or enter new health categories. For example, CLIF Bar & Company, Emeryville, CA, has moved beyond the nutrition bar format to offer its SHOT

line of performance products. CLIF SHOT Bloks come in chewable, 33-calorie cubes that contain caffeine, carbohydrates and electrolytes. CLIF SHOT Energy Gel also provides quick energy to athletes while racing and training, according to the company.

Dr. Sears Family Essentials, Irvine CA, added to its line of Immune Plus Fruit Chews, which contain vitamins C and D, zinc, selenium and Wellmune WGP, a natural ingredient shown to enhance immune health. The product is available in Citrus and Pom-Blueberry flavors.

Mindful Products, LLC, launched Mindful Mints, which contain 50 mg of Suntheanine L-theanine per serving. The product was designed to focus on natural cognitive wellness. It is 100% sugar-free and uses all-natural xylitol.

Demand for convenient products that deliver on taste and efficacy will continue to drive the evolution of nutritional products, in terms of food, beverages and dietary supplements. The variety of products available today reflects an expanding market that will reach more consumers looking to fill the nutritional gaps in their everyday lives.



consumers a non-pill approach to vitamin delivery, but it also can lead to more effective delivery to the body. This is especially true for certain vitamins, like B12, or certain herbal supplements, like resveratrol—which both substantially degrade in the stomach and liver (i.e., upon digestion in the form of pills or drinks)."

By absorbing substances into the bloodstream through the tissues of the mouth, delivery of these particular vitamins and supplements is more bioavailable, he continued. "Three potential drawbacks with current buccal delivery systems are 1) they do not dissolve rapidly in the mouth, therefore leading to some digestion on swallowing (i.e., in the case of gums, chewable vitamins, etc.); 2)



Le Whif products are currently available online in more than 40 countries. They are set to launch in U.S. stores later this year.

they sometimes involve non-nutritional surfactants and/or propellants (i.e., in the case of sprays); and 3) they are not necessarily enjoyable food experiences."

Le Whif Vitamins provide buccal delivery of vitamins while dissolving rapidly, avoiding surfactants and propellants and imparting an intriguing food experience, he added. "In the last regard, Le Whif Vitamin is integrated into Japanese teas and involves the fun

act of breathing food, which has been a good part of the excitement around Le Whif over the past year-and-a-half since the first launch."

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