

DELIVERY & PROCESSING Innovation Rundown

By Lisa Schofield

Technology in and of itself never stops advancing. And, in fact, it may be the singularly defining characteristic of Homo sapiens (besides language).

In the natural products industry, technological sophistication is linking farmers and their crops throughout the globe to suppliers in near instantaneous communications via apps, for example.

Brian Appell, marketing manager with OmniActive Health Technologies, Inc. in New Jersey, said that brand marketers always seek novel ingredients to give their products a competitive edge but sometimes, "it is not the actual ingredient that provides the differentiation, but rather how it is delivered that makes it stand out for companies eyeing new opportunities. Whether they are looking for increased bioavailability or protection of the actual ingredient in different environments, there are many options for today's marketplace."

Christopher Shade, PhD, founder & CEO of Quicksilver Scientific in Colorado, said he believes that the next frontier for supplements is delivery, or

how compounds are effectively delivered into the body. Many compounds like resveratrol and quercetin, he stated, "had great potential for changing metabolism and even prolonging life, but have failed clinically to live up to their potential. This is because of their poor bioavailability."

New technologies using liposomes, nanoemulsions, and lipid nanoparticles overcome these barriers if done correctly, he pointed out.

Appell added that he also sees more growth in personalized nutrition, which is the latest buzzword in today's market. Many consumers are looking for customized solutions in the form of tailored vitamin packs, nutrition recommendations, wellness tests, and more. According to Grand View Research (2018), he cited, personalized nutrition and wellness products make up the largest share of the personalized medicine market, bringing in nearly \$1 billion in 2016 and are projected to grow to \$1.6 billion in sales by 2022.

Suppliers seek to innovate and technology typically solves challenges and

issues to advance quality and speed to delivery.

Illinois-based Van Drunen Farms/FutureCeuticals' TruServ program offers whole food servings from organic fruit, vegetable, and leafy green powders that deliver substantiated USDA (U.S. Department of Agriculture) serving or piece claims in a convenient dose, according to Andrew Wheeler, corporate director of marketing. "Our partners are looking for a clearly defined, defensible serving claim. Since we are the primary manufacturer to most of our whole-food ingredients, we are able to rely upon historical data to provide the regulatory backup that is needed. Thus, this program is available exclusively from FutureCeuticals and Van Drunen Farms."

Quicksilver Scientific, said Shade, led development of pharmaceutical grand lipid nanoparticle delivery of both water- and fat-soluble compounds, as well as crystalline compounds that don't dissolve well in either medium.

"Bioavailability increases have been as high as 100-fold in some of our R&D

materials and routinely increase bioavailability three- to 10-fold," he said. "Additionally, these delivery platforms protect the compounds from metabolism in the GI (gastrointestinal) tract that can lessen the bioactivity of these compounds."

OmniActive's OmniBead beadlet technology is described by Appell as a "smart" coating system that provides a solution where organoleptic characteristics or stability of nutrients present challenges, allowing them to be incorporated into a larger variety of applications and finished products.

For example, he offered, OmniActive's proprietary Capsimax capsicum extract employs OmniBead to encapsulate the beneficial heat of concentrated, highly active, natural capsicum and deliver effective levels of capsaicinoids without stomach discomfort that can happen after consuming red-hot peppers. "This innovation was game changing for us, as well as our customers," he commented. "Now customers can take advantage of the weight management benefits of capsaicinoids in a variety of applications that otherwise would have been a barrier to consumption."

The supplier's UltraSOL nutrient deliv-

ery system is a unique technology that converts lipophilic compounds and poorly absorbed nutrients, to water dispersible ingredients for enhanced bioavailability. This technology has significantly expanded the application of our ingredients for different applications, most notably curcumin. Given the inherent challenges associated with curcumin in terms of particle size, this innovation has great potential to ease the amount of work needed on the formulation side, especially when it comes to beverages.

Most recently, OmniActive's UltraSOL line of curcumin ingredients has been added to several different delivery formats such as stick packs and RTD (ready-to-drink) beverages. In both cases, Appell noted, OmniActive's team was able to add efficacious amounts of the curcumin into these delivery systems without altering or affecting taste or appearance of the beverage. "This is incredibly important for beverage companies that want to innovate but also want the option of including claims based on the amounts they are able to add to beverage formulations," he said.

In some cases, older innovations are still in use as they remain relevant. For

example, BI Technologies Identilok, developed in 1995, uses multiple tests to guarantee the botanical ingredients are the correct genus and species, according to Randy Kreienbrink, vice president of marketing.

Identification is not the only challenge, however. He noted that one of the other biggest challenges when working with botanical ingredients is the physical form of the product. BI steam sterilizes the incoming whole raw materials to ensure microbial stability and also processes challenging herbs to provide customers with the correct particle size and density for consistent and accurate compression of tablets or filling of capsules. "Particle size may seem like a small issue, pun intended, but in reality using the wrong powder can affect the total does in a filled capsule as well as the compressibility of tablet which can lead to incomplete dissolution and malformed tablets," he explained. "Those are the type of issues no finished product manufacture wants to deal with."

These are just a few examples of how suppliers are ensuring ingredients meet stringent demands of brand marketers, regulators and the ultimate arbiters—consumers. **NIE**

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