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Staying Immune

Immune health is an important segment for consumers and industry, but only certain natural ingredients are backed by recent studies. However, this growing library of research touches all corners of the nutrition world, including basic nutrients, botanicals and specialty compounds. The winning ingredients include vitamin D, ashwagandha and probiotics among other vitamins, herbs and more. The studies are not just on overall benefits, but also often detail specific actions on particular immune system components.

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For the Ladies

Women are generally more interested in health and prevention than men, making them a key demographic for natural products manufacturers. Women are also more willing to educate themselves on products they choose for themselves and their families, so manufacturers should use marketing prowess to ensure their customers don't fall for misleading headlines about the "dangers" of supplements.

Many natural elements can aid women from puberty to post-menopause, and as the population ages, more women are interesting in a more natural way to health. But it's up to product manufacturers to show how these supplements are safe and effective.

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Top Superfruit issues

- Formulating with superfruits requires a balance between minimal processing and delivering a product with an adequate shelf life.
- Some superfruit claims are overhyped and leave the market quickly; those with science substantiation have staying power.
- A high ORAC value is certainly still a selling point, but it is far from the only thing a consumer wants in a superfruit product.

Formulating with Superfruits

by Kate Parham

While the superfruits category may not be as high profile today as it was a few years ago, when Oprah talked about açai, and XANGO started its expansive growth in the multilevel marketing (MLM) category, it continues to attract consumer interest. Fortunately, there is a growing awareness of the importance of scientific substantiation along with a broader portfolio of ingredient options to choose from.

Formulators working with superfruits first have to define their goals and objectives as they relate to a product, functionality and claims standpoint, according to Stefan Wypyszyk, senior business development manager at Stiebs. Equally important is it to determine how the product will be sold: as a dietary supplement, food or beverage, or as a medical product.

The next step is ingredient sourcing. “Superfruits are one of the most exciting growth areas in the industry, but a great superfruit ingredient begins with the environment it is grown in,” said Marina Linsley, marketing director, NP Nutra. “[We] work with local farmers in the most pristine environments to ensure the soil is clean and free from contaminants, and that chemical fertilizers and pesticides are never used, ensuring the best-quality fruits are grown.”

However, starting with the highest quality fruits is only step number one; maintaining the active constituents is a big challenge. “A superfruit should be in the form closest to what exists naturally with a minimum of processing,” suggested Brien Quirk, director of R&D, Draco Natural Products.

Any type of processing—drying the whole fruit, juicing, pureeing, extraction, etc.—can affect the phytochemical composition of the raw materials. Stability can be achieved in many ways, with each method having a profound effect on the preservation of nutrients, phytochemicals and bioactivity, said Alexander Schauss, Ph.D., FACN, senior research director and CEO at AIBMR Life Sciences Inc. For example, he noted two cold-processing technologies: spray drying and freeze drying. “[Spray-drying] may be much cheaper, but the end result could be a food that has lost a significant amount of its bioactivity compared to the same food [after being] freeze-dried.”

Linsley agreed: “Freeze drying provides the best alternative for retaining the integrity of cell structure, flavor, color and nutritional properties.” In addition, as raw fruits contain enzymes that are susceptible to oxidation and nutritional degradation after harvesting, many suppliers locate their processing facilities near the harvest sites to ensure optimal quality of the raw materials.

Quirk said Draco employs two major processing steps to capture the full spectrum of antioxidant and bioactive plant compounds. He explained: “The first component is made by juicing the whole fruit, including the peel, seeds and rind,

concentrating it in a vacuum evaporation system. Then, the pressed fiber that remains, [which is] still rich in many plant compounds, is processed with water extraction to obtain an additional extract. All of the antioxidants, polysaccharides, pectins, organic acids and other plant compounds are obtained in this manner. These two components are then combined together and spray dried in a special process that prevents the loss of valuable compounds. In this state, the dried carrier-free powdered extract is stable and very similar in important actives that the original fruit contained.”

Similar processing steps are used by Stiebs to ensure stability. For example, Wypyszyk detailed when formulating Stiebs’ TRUE Pomegranate® Extract, the company, “took great care to ensure the HPLC anthocyanin fingerprint of our extract maintains the fingerprint found in the fruit and juice. This is vital to the functionality of the ingredient as the fingerprint of the six anthocyanins in pomegranate are well established and used, in the juice, to establish identity and authenticity.”

One best practice is putting in place a comprehensive quality control program that ensures identity and purity at key stages of harvesting and processing. Ethical Naturals’ program, for instance, is called “Nature Verified by Science.” “We use a patented method for producing fruit extracts that contain high, defined levels of polyphenols and ORAC [oxygen radical antioxidant capacity] values,” said Cal Bewicke, president, Ethical Naturals. “These are combined with a long-term stability verification program and extensive batch-related quality assurance testing.”

Another factor to consider when formulating with superfruits is toxicity. Consider the case of soursop (*Annona muricata* L.), a fruit once widely consumed in the French West Indies, until high consumption was found to be linked to incidence of atypical Parkinson’s disease (*Lancet*. 1999 Jul 24;354(9175):281-6). “Once the compound responsible for causing the neurodegenerative disease was identified and experimentally proven to be responsible for it, people realized chronic consumption of that fruit was ill advised,” Schauss said. “As a result, the incidence of the disease dropped precipitously, [and we learned] any exotic fruit needs to be determined safe for chronic consumption.”

Supporting Claims With Science

Superfruits went on a “high” the past few years with big claims, ubiquitous status and market saturation. Today, the marketplace shelves look a bit different, as consumers have become savvier shoppers. “There has been a lot of overly enthusiastic marketing of some superfruit products, to the

point that acai, for example, has become a frequent subject of spam emails,” said Shaheen Majeed, marketing director at Sabinsa. “This can lead to consumer confusion and the danger of the product category [as a whole] being unsustainable.” But scientific substantiation can make a difference. For example, after a recent study was published in the *Journal of Nutritional Biochemistry* reporting açai pulp contained potent anti-inflammatory activity (DOI:10.1016/j.nutbio.2011.06.013), consumers understood what made it worth consuming.

At the same time, fruits with exotic origin continue to attract media attention. “If one has not heard of it before, or cannot pronounce or spell it, it will receive more attention,” Schauss said. And each year, more exotic fruits are entering the scene, becoming “stars,” Majeed said. “Given that many products in this category are subject to extreme levels of ‘hype,’ we feel the best growth is in products that are prepared with care, administered in high enough levels to have a beneficial effect for the consumer and are supported by science,” he added.

It’s true: “Many superfruits have fallen by the wayside due to lack of scientific substantiation,” said Blake Ebersole, technical director, Verdure Sciences. “After mob rule and network sales fads diminish, only science remains to support and sustain ingredients.” Fortunately, much progress been made in superfruits with the development of scientific standardization.

For starters, a more authoritative definition for the term is arising. “There is a misconception that a superfruit has this status of being super just because it is new, exotic or appears to have more claims than other more ordinary fruits,” Quirk said. “However, the real definition of a superfruit, as we have experienced through communications with our customers and other scientists, is based on a ‘super fruit’ providing tangible health benefits that are very real and substantiated.”

But that doesn’t mean exotic superfruits are off limits. Draco has developed new extracts from exotic fruits including jackfruit, tamarind, ume plum and blue honeysuckle berries. “Each of these has unique, [tangible] benefits,” he said. “For example, jackfruit is used for digestive health, helps boost immune function and has beneficial properties for allergies. Tamarind has cardiovascular health benefits, significantly reduces diastolic pressure, total cholesterol and LDL cholesterol, and has polysaccharides with immune-stimulating properties. Blue honeysuckle berry has one of the highest levels of phenolic compounds that are antibacterial and may also be beneficial for diabetes and cancer prevention.”

Although açai is still the clear category leader, Linsley said fruits such as dragonfruit and maqui are also generating a

lot of interest. “With growing concerns about sustainability, rancidity and allergy in marine-sourced essential fatty acids (EFAs), there’s a real opportunity for plant-based sources such as blackcurrant seed, sea buckthorn, acai and sacha inchi to make an impact,” said Linsley, who also cited a wave of interest in homegrown superfruits—particularly berries with high levels of antioxidants and a rich variety of phytonutrients, such as cranberries, blueberries, raspberries and blackcurrant.

Is ORAC Enough?

“When superfruits first made a big splash several years ago, everyone was racing to find the next new, hot superfruit with the ‘highest’ antioxidant potential, and ORAC was the only game in town,” Wypyszyk said. “Today, people have realized the story of each superfruit is unique and complex, and a puzzle that needs to be solved. As a result, there is a great amount of focus on research and science using multiple tools and techniques.”

So, it’s not just about ORAC anymore. In most cases, there is a mix of studies to substantiate the health benefits of superfruits, ranging from in vitro and in vivo to phytochemical analysis and human studies. “The ORAC score is still very helpful, especially if it is high, because there is a direct correlation between antioxidant capacity and the ability to reduce cell damage from numerous free radicals sources,” Quirk said. But it’s not the end all and be all. “The ORAC score can also be matched with the phenolic levels or specific bioactives, such as flavonoids, since there are direct correlations between these parameters and the health benefits.”

New Application Areas

Many skin care companies are picking up on this trend, launching superfruit-based cosmetic products. However, the use of superfruits in cosmetics is not entirely novel. The beauty regimes of many traditional cultures have traditionally used fruits like papaya and strawberry in facial masks to nourish the skin, Linsley said. “Coconut oil and sacha inchi oil have a long history of use for protecting and softening skin and hair, and schisandra berry has been used internally in the pharmacopeia of Traditional Chinese Medicine (TCM) for centuries as an aid to enhancing beauty,” she said

In the North American market, however, there are many factors to consider, Quirk advised, such as the stability of the actives in an aqueous medium, bioavailability to skin cells if being used topically, and ensuring there is no allergen, mutagenic or sensitization potential.

There are many benefits of formulating skin care products with superfruits. However, just as with other superfruit products, “The main challenge remains with regard to identity, purity, activity consistency and proof of superfruit skin care using valid scientific methods,” Ebersole said.

Ultimately, it will take mindful attention throughout the supply chain to deliver efficacious, mindfully formulated products—whether supplements, foods or topicals—to interested consumers. □

Kate Parham is a Virginia-based freelance writer.

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