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## Effervescent Technology Adds Sparkle to Supplements © NIE

By Fred Wehling

Effervescent dietary supplements are pretty much the norm in Europe. Stateside, however, they are catching on slowly. Dietary supplement manufacturers that have been in business for years can add some zest to their product lines by adding an effervescent tablet or powder; by doing so, they will extend their target market by bringing in new consumers.

Before contracting out to a manufacturer skilled in composing your effervescent products, realize what is feasible and what is not.

### Break Out the Bubbly! Successful Effervescent Supplements

By Lisa Schofield

While walking through the carnival-like aisles of the dietary supplement industry's largest retail tradeshow, one could see effervescent supplements popping up more and more frequently—and retailers are buying. Following is a rundown of some of the newest entries in this burgeoning category, including a couple of brand new companies that have launched premier supplements.

## Ingredients

Ingredients that are ideal for an effervescent dosage form fall into several categories:

- Those that are difficult to digest or disruptive to the stomach. A classic example is calcium carbonate, the most widely used form of calcium. In a normal tablet or powder, the calcium carbonate (in a healthy person) dissolves in the stomach acid, and is carried into the digestive system for absorption. As the calcium carbonate dissolves, however, it releases carbon dioxide, resulting in stomach gas.

On the other extreme, as a person ages, less and less acid is produced in the stomach. In these instances, the calcium carbonate passes through the stomach undissolved, and causes constipation. By taking an effervescent formulation, the calcium is

## ElectroBlast

Nina Anderson, formulator of ElectroBlast and president of the company that markets it, LJB Piper LLC, Lakeville, CT, saw a need for a convenient-to-take electrolyte supplement. "I had been taking an ionic mineral supplement in liquid form for years, but when I travel I found it extremely inconvenient. I wanted something that was portable and that was tasty when added to water. In addition, packets of powder supplements tended to break rather easily, causing a mess; I wanted a tablet instead of a powder."

After forming the company with this product mission in mind, it took two years to arrive at the proper formula for the effervescent tablet, she related. "We wanted a truly natural product and had approached many

dissolved in water, and is readily available for the body to absorb, without stomach gas or constipation.

- Those that must be consumed in large quantities. Effervescent ingredients serve to buffer the water so that the stomach receives a buffered solution and empties quickly. Also, the product typically is self mixing and many times can be flavored to taste much better than can be achieved with a noncarbonated powder in water.
- Those that are susceptible to light, oxygen or moisture. A typical formulation has less than 0.5 percent free moisture and should be packaged in 0.001" thick aluminum to completely block out any moisture, light, and oxygen. We have formulations which, after six years, look, taste,

European and U.S. manufacturers. We finally found one that has the ability to create a natural formulation.

"We didn't want to use common excipients such as propylene glycol, which is used in de-icing fluids in jets nor polyethylene glycol," Anderson continued. "We also didn't want to use any sugar or artificial sweeteners such as aspartame." The result is a natural lemon/lime flavor often associated with thirst quenching.

### **Athena Vitality**

Naturopathic physician Michelle Hillis of Athena Labs, LLC, Portland, OR, said she wanted to go the extra mile in helping her patients comply with their supplement needs. "Many of Michelle's patients were already taking a lot of pills, and she wanted to provide a comprehensive vitamin solution in a form

and dissolve the same as the day they were produced.

- Finally, there are a growing number of people who cannot, or dislike, swallowing tablets or capsules. Many supplement's dosages require several tablets to be swallowed at one time. The elderly, in particular, have more difficulty swallowing tablets as they age. With an effervescent system, one dose can usually be delivered in just three to four ounces of water, which is about what someone would need to swallow to take a conventional tablet.

We have successfully produced effervescent products containing amino acids, vitamins, minerals, herbal extracts, plant growth hormones, and a host of pharmaceutical ingredients.

### **Powders**

The decision to develop a

other than a pill," said David Hillis, company president. "She has (since) noticed a huge increase in patient compliance with the effervescent vitamin formula."

The second reason Michelle Hillis chose an effervescent delivery system is the health benefit of the form—effervescent vitamins offer an increase in bioavailability of the nutrients and higher absorption than capsules or tablets, David Hillis noted. "We also saw a need for a professional-grade line of effervescent formulas," he added.

Athena is offered in sachets. David Hillis explained, "We were inspired by the terminology of a consumer group identified by the Natural Marketing Institute in Harleysville, PA, as the Well Beings.

powder form of an effervescent product usually is based on three key elements:

1. The size of the dose of active ingredient. A tablet can hold up to 2,500 mg of active ingredients, provided it is formulated correctly and the ingredient(s) are water-soluble.

2. The speed at which the customer wants the formula to dissolve. Typically if an ingredient is not highly soluble in water, or if the dose is simply too large, it will be placed into a powder pouch.

3. Cost factors. Tablets can be produced and foil wrapped or placed into tubes at a much faster speed than the same formula can be placed into a powder pouch. Also, a pouch uses much more foil, which adds to the cost of the packaging, as well as the cost of the outer carton and case.

Our effervescent sachets were designed with this group in mind. We created an experience of taking vitamins that has two elements. The first is the ritual of mixing the sachet contents with water. The second is sitting down and enjoying it."

Hillis added that the packaging is a key part of the marketing mix, particularly for a niche market. "As a brand new company, we need to rely on the statement we make on the shelf. So we looked to the tea industry as inspiration, specifically Tazo teas, which are understated in neutral colors. We feel that neutral colors will speak louder on the shelf."

In addition, Athena Labs offers single-serving sample packets. In her book, *Eve-olution*, consumer trends analyst Faith Popcorn pointed out

An effervescent product is designed taking into account all the ingredients and ingredient interactions and reactions that take place during the blending, tableting and packaging of the product.

### **Production**

There are several sources of carbon dioxide from which to choose. Typically carbonates and bicarbonates of sodium, potassium, calcium and magnesium are used in making effervescent dietary supplements. Triprotic and diprotic food acids are the best sources of acid. These include citric, ascorbic, tartaric, adipic and malic acids. While other acids and carbonate sources can be used, typically they are very expensive, and do not bring much benefit to a formulation.

Binding of a tablet can be achieved in several ways.

that women are five times more likely than men to pass information and/or product samples to others. "Single-serving sample packets encourage women to share their Athena experience," said Hillis.

### **Other Products**

Contract manufacturer NuLab, Inc., Clearwater, FL, now offers for dietary supplement marketers Refresh Express, which contains freeze-dried orange juice. Hakan Johanson, CEO, explained how tough it was to arrive at an effervescent formula that tastes good. "Getting a good-tasting liquid requires some ingenuity. A formulator can add artificial sweeteners, but we use real freeze-dried orange juice. The problem with using a natural starch substance in an effervescent formula is that it tends to foam with large bubbles, which is

Typical binders may be used, or a vacuum processor can be used to fuse the acid and carbonate sources together to form a compressible material. Several processes involving fluid bed granulation and drying can be found in the literature, as well as alcohol granulations, which are simply dried in conventional drying ovens.

Effervescent tablets or powders are produced in much the same manner as are conventional tablets and powders, with the exception of the environment. All areas must be under strict humidity controls or the formulations will begin a chemical reaction after being packaged, and in essence will self destruct since a byproduct of any effervescent reaction is water and carbon dioxide.

The best way to stabilize

not generally appealing to consumers, so this was the problem we had to solve."

Marisol Delfino, Nulab's director of quality control, added, "The beauty of effervescent formulas is that you can offer minerals in an ionic form, which results in high assimilation of the nutrients, a critical factor when it comes to handling mineral deficiencies for the consumer."

Also new this year is Carni-Fizz effervescent tablets from Bricker Labs, West Bend, WI. Each tablet provides 1,500 mg L-Carnipure L-Carnitine L-Tartrate from Lonza Group, Fair Lawn, NJ. It is offered in Lemon Lime and Cherry flavors.

EfferLife, from Quest in Mississauga, Canada, is a line of effervescent tablets that are very popular in Canada and have begun distribution in

an effervescent product is by producing it in a strict humidity-controlled environment, and by packaging it in a suitable moisture barrier.

Ingredients must be anhydrous, and should be tested against each other to be sure no chemical reactions take place that can adversely affect the integrity of the effervescent system.

### **Packaging Materials**

Many effervescent product failures occur each year because inadequate

packaging materials are chosen for them. Many times the choice of packaging material is made based on pricing, rather than considering stability issues.

Effervescent dietary supplements, after packaging, should be placed at 80 degrees C and 75 percent relative humidity for three months to determine whether they will be stable for at least two years if stored in normal storage conditions. At the end of three months, physical and chemical tests should be performed to determine what, if any, degradation of the product has occurred.

The most typical reasons for degradation of an effervescent system are:

- The packaging material does not have a moisture

the States. The line features glucosamine, calcium, multivitamin, and vitamin C.

LiFizz Effervescent Vitamins, Jupiter, FL, offers 10 effervescent tablet products, including three for children.

According to sources contacted for this story, the market for effervescent dietary supplements remains wide open for new entries.

vapor transmission rate of 0. Or, more simply put, moisture vapors are able to get into the package because it is inferior.

- The seal of the foil pouch has been compromised. This could be due to too much dust in the packaging areas or a machine malfunction during wrapping of the product.
- The raw materials used have too much moisture in them. If there are any traces of moisture in the finished product, it will activate the acid and carbonate source, causing a release of water and carbon dioxide. The supplement will eventually lose its effervescent activity.
- There are ingredients in the formula that are not compatible with each other, or with the effervescent components chosen for the product. Here, dietary supplement companies should ensure their R&D departments collaborate closely with the contract manufacturer, and learn what materials work together to create a successful effervescent product, and what materials are not suitable.

### **Trial and Error**

There really has been no advances in equipment for the production of a stable effervescent dosage form. The technology is held by few companies, and while new processes are continually being developed, there is little published information available that a formulator can rely on to build a successful product. The best way to learn how to make effervescent products is by a series of trials and errors, which will eventually lead to success. NIE

**Fred Wehling** is president of Amerilab Technologies, Inc., New Hope, MN, a leading contract manufacturer of effervescent products. Amerilab is launching a full joint support product line that will contain fully absorbable calcium, magnesium, boron, zinc, glucosamine, chondroitin, and soy isoflavones in an effervescent delivery system. Samples of two of the four new products will be available at SupplySide West in December. Wehling can be reached at (763)525-1262, ext. 102.

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