Dry Processing Technology

Focus on Powder & Bulk Operations

Wayne Labs, Senior Technical Editor

Thoroughly dry, but rich in nutrients

Efficient technology preserves vitamins, minerals.

Cranberry slurry enters the MCD Technologies Model 2 RW dryer. The dryer is approximately 50-ft. long and six-ft. wide. Source: MCD Technologies.

BioSan Laboratories Inc. produces high-quality nutritional products, primarily multivitamins and multiminerals. Its two best-known product lines are MegaFood Daily Foods and MegaFood Essentials, which are sold in health food stores throughout the US and Europe. In addition, the company makes specialty powders from fruits and vegetables and these are sold to food and beverage processors for use as ingredients. In total, the company makes about 260 products with several hundred SKUs.

BioSan processes cranberries, blueberries, oranges, broccoli and many more fruits and vegetables; its focus is on whole food nutrition—not, for example, USP-rated synthetic vitamins. Processing the vitamins, minerals and other materials is not as easy as it sounds. BioSan acquires vegetables and fruits both in fresh and frozen forms, so all the nutrients have been preserved. It then dries the fruits and vegetables from a slurry, which may have particle sizes sheared down to 10 microns and solids contents ranging from 5 to 40%.

Drying is the most critical part of the process, says company Executive Vice President Richard LaFond. "The destruction of phenolics, enzymes, aromatic compounds and other heat-sensitive nutrients is a major concern for us," he says. "Many of our products are hygroscopic; therefore, the ability of the dryer to dry a hygroscopic product to a low moisture level without heating the product to a high temperature is crucial."

LaFond needed a dryer that could operate 24 hours a day, all year long at his new Durham Research Inc. facility in Londonderry, NH. Downtime could not be tolerated, and outside weather conditions (from 15° to 100°F) throughout the year could not affect quality. Because of continuous operation, energy costs were also critical.

LaFond investigated sun-, freeze-, drum-, tray- and spray-drying, as well as other drying technologies. Technologies such as tray-drying use temperatures of 200°F or more and break down enzymes, so they were out of the running. He also immediately wrote off sun- and drum-drying. LaFond had read about MCD Technologies, (located in Tacoma, WA) and decided to investigate further. He met with the company's founder, Richard Magoon, and together, they tried running various product samples through MCD's Model 2 RW (Reflectance Window) dryer at the Tacoma site. After analyzing the output, LaFond found this dryer provided the results he wanted—product containing the original color, vitamins, minerals, nutrients and enzymes.

Another plus Magoon designed into the system was a Clayton gas-fired steam generator that provides just the right amount of steam for the process. Magoon said he could have selected any boiler for the dryer, but the Clayton unit comes up to operating temperature quickly and is very efficient, which keeps LaFond's energy bills affordable.

"We put the Clayton in when we put the dryer in, and it has run very, very well," says LaFond. "It doesn't require any specialized labor to run the dryer and the Clayton generator."

With PLC-based controls, the dryer provides product with consistent, high-quality results. At any given time, LaFond knows production rates, energy usage and all key process parameters, and he knows what it's costing him to make product on an hourly basis. The dryer practically cleans itself and just keeps on running, LaFond states. ◆

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