

Fortifying with IRON

Daily dietary requirements for iron vary by individual and are affected by factors such as growth periods for kids and menstrual cycles and pregnancy for women. The National Academy of Sciences set the Recommended Dietary Allowance for men and post-menopausal women at 8mg a day and at 18mg for pre-menopausal women. For pregnant women, it is 27mg, and for those breastfeeding and not menstruating, it is 9mg.

Because the average U.S. daily diet contains 12-15mg of iron, to prevent iron deficiency in high-need population segments, doctors often recommend iron supplements.

Unfortunately, "Many iron sources that exhibit the best bioavailability, such as ferrous sulfate, adversely affect food and beverage quality by accelerating lipid oxidation, producing unfavorable color or flavor and causing severe irritation of the gastrointestinal system," says Lekh Juneja, managing dir., nutritional foods div., Taiyo Kagaku, Japan. (Taiyo International Inc., Edina, Minn., is the North American subsidiary.) "Compatible and non-reactive iron compounds are needed for fortification of foods as they have less of an 'iron taste' compared to soluble iron. However, due to insolubility issues, precipitation of such iron ingredients prevents fortification in large amounts.

"Using our proprietary 'Nutrition Delivery System,' which is a super-dispersion technology, we now offer product developers SunActive Fe™," Juneja adds. "SunActive Fe is a blend of ferric pyrophosphate, an insoluble iron ingredient, and unique emulsifiers and processing aids. It is readily dispersible in liquid formulations and produces no precipitation. The technology masks any disagreeable iron flavors without affecting the flavor of the final product."

SunActive Fe is generally recognized as safe (GRAS). When dispersed in water, it creates a clear to slightly milky white solution. It is stable against heat, salt, pH and oxidation, and is mild on the gastrointestinal system, providing a non-irritating iron



Korea's Mael Dairy iron fortified milks targeted to small children.

fortification with superior absorption properties and bioavailability.

A recently completed human clinical trial conducted at the Institute of Food Science and Nutrition, Zurich, Switzerland, by Richard Hurrell and other researchers, compared iron absorption of SunActive Fe to that of ferrous sulfate in a stable isotope bioavailability study with infant cereal and a yogurt drink. "Results indicate that SunActive Fe has the same bioavailability as ferrous sulfate in adult women," says Juneja.

Product developers in Japan and Europe are using SunActive Fe to formulate iron-fortified milk, yogurt and sports drinks. Such products generally contain about 1mg of iron per serving, which equates to 12.5mg of SunActive Fe per serving.

"Although the exact method for adding SunActive to a product depends on the specific formula, typically it is diluted with water (about one part SunActive Fe to 20 parts water), blended, homogenized and added to the product just prior to pasteurization," concludes Juneja.

Mael Dairy Industry Co., Seoul, Korea, manufactures a line of iron-fortified milks targeted to very small children, "who need large amounts of iron for proper growth and development," says Wan-Sik Kim, mgr., R&D. "The brand is called Urri Growth milk. The First Milk variety contains 0.37mg/100ml, and the Growth Milk variety contains 0.42mg/100ml. **NS**

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