



# DAIRY INGREDIENTS FAX

California Polytechnic  
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## Calcium-Enriched Dairy Ingredients

By Sabry Madkor\*

### Calcium Counts: More Calcium is Needed:

The New York Times has recently touted calcium as the "mineral superstar nutrient", a name it justly deserves, because it does so much more than giving strength to the bones and teeth. Research suggests calcium is necessary for many body functions; it can help reduce the risk of high blood pressure, cut colon cancer risk and ease premenstrual syndrome (*Nutrition Reviews, July 1994*). In 1997, the Food and Nutrition Board of the Institute of Medicine (IOM) of the National Academy of Sciences (NAS) released new recommendations for calcium that are higher than the 1989 RDAs for most age groups. The most notable changes are the recommendations for children ages 9 to 18 (1,300 mg) and adults, ages 51 and older (1,200 mg). These new recommendations are also closely approximate to optimal calcium intakes recommended by the National Institutes of Health (NIH) Expert Panel in 1994. The world health organization recommended an increase of calcium intake so that at least 50% of people aged 25 years and older consume two or more servings of calcium-rich food daily.

### Consider Your Calcium Source:

Consumption of dairy products is one of the easiest ways to meet calcium recommendations. Consumer confidence in dairy healthfulness begins with calcium, according to several recent surveys conducted for Dairy Management Inc. (DMI). About two-thirds of consumers agree that dairy products are the best source of calcium and more than 70% believe that consuming calcium rich dairy products helps prevent osteoporosis. While foods containing calcium can be found in each of the Five Food Groups, those from the Dairy Group — milk, yogurt, cheese, frozen yogurt and ice cream — are the primary sources of calcium in the U.S. diet and contain a high efficiently-absorbed form of calcium (*Dairy Foods, Nov 1999*). According to DMI, in 1997 milk and milk products contributed 73% of the calcium available in the U.S. food supply. To achieve significant calcium levels in food formulation, most products utilize a rich calcium dairy ingredient for fortification. Standard nonfat dry milk contains about 1,300 mg calcium/100 grams; dry sweet whey contains 700 mg calcium/100 grams; and dry acid whey weighs contains 2,200 mg calcium/100 grams (*Agriculture Handbook No. 8, Dairy Foods, Nov 1999*).



### Calcium-Enriched Dairy Ingredients:

A refined category of dairy ingredients can be developed: those that are calcium-fortified. Calcium fortified dairy ingredients such as milk powder, caseinates, milk protein concentrates and whey protein fractions can be used to provide specific functional property without creating serious problems in food formulations. These ingredients can make insoluble calcium dispersible and suspendable. Depending on requirements, calcium levels of these ingredients can range between 2.7% to 15.0% of total weight to provide 100% of the RDI in some food systems. With the current health concerns about calcium consumption, these new milk ingredients can offer the product developer the potential to fortify current formulas or add calcium to foods not typically fortified with the chemical element. For application of calcium-enriched dairy ingredients in food formulations several issues have to be considered to insure acceptable flavor, good mouthfeel and good stability during shelf-life. Solubility is an important issue and influenced greatly by the pH and heat treatment of the food system. A current research project is conducted by Dr. Tong's group to characterize the appropriate forms of calcium that can be used to prepare calcium-enriched dry milk. This investigation is aiming to evaluate the specific functional attributes of calcium-enriched milk powder that are significant when the powder components are used for recombining or as dairy-based ingredients in food products.



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### Calendar of Events

Cal Poly 2<sup>nd</sup> Annual Dairy Science & Technology Basics for the Farmstead Cheesemaker Short Course, May 2-5, 2000. Located at Cal Poly Dairy Products Technology Center, San Luis Obispo, CA. For more information contact: Laurie Jacobson, (805)-756-6097 or E-mail, [ljacobso@calpoly.edu](mailto:ljacobso@calpoly.edu)

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