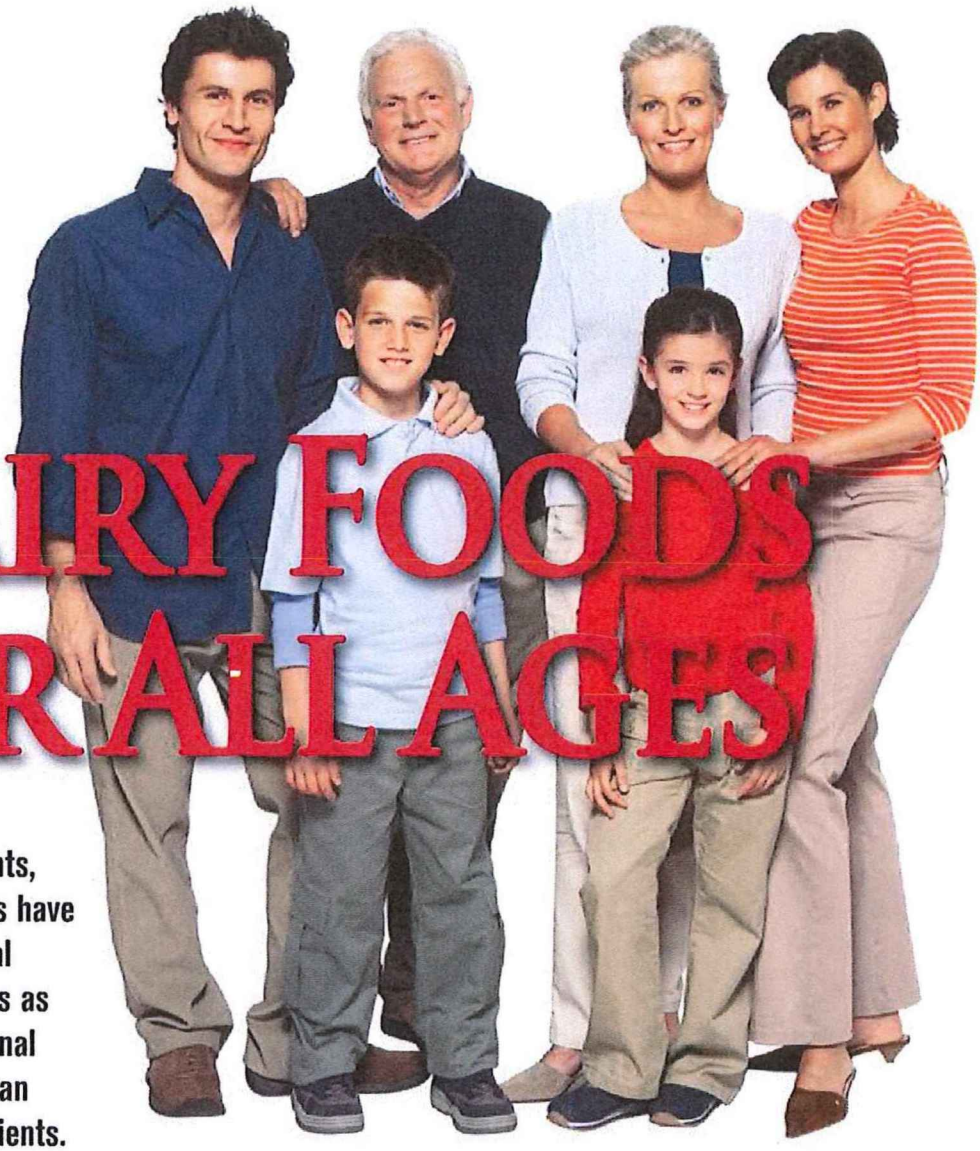

DAIRY FOODS FOR ALL AGES

Infants, adolescents, adults and seniors have specific nutritional needs. Milk serves as a base for functional ingredients that can deliver those nutrients.

By Donna Berry, *contributing editor*

Nutritional inadequacies are common among both genders and through all stages of the lifecycle. The majority of Americans simply do not eat a diet that is well-enough balanced to consume a sufficient amount of essential nutrients. Advancements in nutritional sciences during the past 20 years have provided ingredient suppliers and formulators with knowledge to create better-for-you foods that meet the nutritional needs of specific demographics.

Dairy processors are well-positioned to participate in the trend of fortifying foods, because they have a nutrient-rich base (milk) to which they can add vitamins, minerals and other essential nutrients.

Most Americans want nutrition solutions that speak to their personal needs. The majority believe they have some control over their health, and that food and nutrition play the most important role in maintaining and improving their overall health, according to the "2011 Functional Foods/Foods for Health Consumer Trending Survey" by the International Food Information Council (IFIC), Washington, D.C.

Additionally, most consumers agree with the concept of "functional foods," which are defined as foods and food components that may provide benefits beyond basic nutrition. These foods and components are believed to improve overall health and well-being, reduce the risk of specific diseases or minimize the effects of other health concerns. Examples are fruits and vegetables, whole grains and fiber, calcium in milk, and fortified beverages, such as vitamin D fortified milk.

There are opportunities to formulate for the needs of specific demographics. For example, women's dairy products can be designed to promote readiness for pregnancy and a healthful nine months for both mom and baby. Products for children and teens can be enhanced with nutrients to meet the needs of their growing bodies and minds. For on-the-go active adults, dairy products can be formulated to deliver nutrients that boost immunity, strengthen the body and defy aging. And for seniors, nutrient-dense formulations can promote mental and physical health.

■ Stonyfield YoKids Greek yogurt comes in two child-friendly flavors–raspberry and strawberry–with 6 grams of protein. Yogurt, made with low-fat organic milk, is an excellent source of calcium.

Before birth

Proper nutrition begins before birth, which is why pregnant women are typically prescribed a prenatal vitamin. In addition, expectant mothers often supplement their diets with docosahexaenoic acid (DHA), a long-chain omega-3 fatty acid that is found throughout the body. DHA is a structural fatty acid in the brain and eyes and is recognized as supporting good heart health.

DHA is one of three important dietary omega-3 fatty acids. The other two are alpha-linolenic acid (ALA) and eicosapentaenoic acid (EPA). Natural sources of DHA and EPA are oily fish, which ingest DHA-rich microalgae. There is a DHA ingredient derived directly from microalgae. ALA is found in plants such as flax and chia, as well as certain tree nuts. ALA can be converted into DHA and EPA; however, the body converts it rather inefficiently and with much variance among consumers based on external and internal factors.

DHA supplements are available, but as more people rely on whole foods for adequate nutrition, DHA-fortified dairy products have become increasingly attractive. Moms-to-be typically consume more dairy for the other essential nutrients inherent to milk, most notably calcium. Dairy marketers take note: Products designed to meet the nutrition needs of this demographic represent an opportunity.

Research supports the role that DHA plays in promoting health after birth. DHA is naturally present in breast milk, and most infant formulas are enhanced with this essential fatty acid. However, upon weaning and the introduction of solid foods, DHA can quickly become deficient among toddlers. This is a concern. Studies show that DHA plays a critical role in visual and cognitive development during the early years of life. A study published in the Journal of Pediatrics (1992. 120:S129-38) found that uptake of DHA by the brain is significant between ages 2 and 5 and supports the substantial accumulation of DHA by the brain during this critical growth period.

An opportunity exists to design more dairy products to meet the nutritional needs of toddlers and preschoolers. Flavor, taste and texture profiles must be carefully selected because this age group can be picky eaters.

Nutrition for education

As their children grow older, parents are challenged to manage their children's diet because outside influences play a much larger role in meal and snack selection. Yet, the years from elementary through high school remain developmentally critical because they set the stage for lifelong health. It is during these years that diet can have an impact on the development of allergies, asthma, diabetes, eyesight, obesity and learning and behavioral problems.

During the earliest years, the immune and neurological systems are still developing. The diet must be rich in nutrients that fight disease and build brain power. DHA and EPA help with the latter, while a diet rich in immunity-boosting nutrients, such as antioxidants and various vitamins and minerals, assists with the former.

As permanent teeth come in and children go through puberty, building bone density is essential for the later years. Not only are calcium and vitamin D key, but research shows that other vitamins and minerals, most notably fluoride, iron, magnesium, phosphorus and zinc must be present in sufficient quantities.

Older children become opinionated about their food choices, so it is critical that dairy products designed for this demographic speak to their needs, interests and image. An enhanced milk beverage must be cool enough to compete with a cola, while a cheese snack should appear different than the string cheese they ate as a youngster.

Girls only

A female's dietary needs change more dramatically than a man's throughout the lifecycle because of the very specific nutritional needs required for the development, use and shut down of the reproductive system. In particular, during the teen and young

adult years, many women will starve their body of important nutrients in order to maintain a slim figure. Unfortunately, the impact of this is not realized until later in life.

In addition to the nutrients already mentioned, vitamin B12 and iron are two others that are typically deficient in young women. Both are provided mainly by foods of animal origin, but body-conscious women often avoid center-of-plate proteins to reduce calorie and fat intake. Further, menstruating women naturally lose iron every month, which can contribute to anemia.

During the decade leading up to menopause, the body produces less estrogen. But the body still needs estrogen which promotes heart health, preserves bone strength and stabilizes mood swings. Many women rely on supplementation or turn to soy-based foods because soy is rich in isoflavones, which are recognized as functioning in the body in a manner similar to estrogen.

The plant-derived compound genistein, which is the principal isoflavone found in soy beans and soy foods, has been shown to reduce menopausal symptoms, including the number and duration of hot flashes in menopausal and post-menopausal women. Research also suggests that genistein plays a unique and important role in bone health. As estrogen levels decline and bone mineral density decreases in menopausal and post-menopausal women, genistein exerts estrogen-like regulation of bone metabolism and assists in the bone remodeling process.

When formulating female-only dairy products, calorie content must always be considered and should typically stay as low as possible. Women also tend to prefer indulgent flavors that satisfy their sweet tooth without fear of expanding their waistline.

Men have their needs

Body builders being the exception, adult males have historically been ignored when it comes to foods designed for their specific nutritional needs. But the popularity of Greek yogurt among this demographic has shown formulators that there is real interest by men for foods that speak to them.

Greek yogurt is all about more protein in basic, non-"frou-frou" flavors. Men want neither their masculinity challenged, nor their independence threatened. Nutritional messages must be subtle, which is exactly what transpired with Greek yogurt.

For men it's all about vim, vigor and vitality. There are a number of nutrients associated with male-specific benefits. For example, lycopene is a carotenoid associated with prostate health. Vitamin D, in addition to its role in bone health, has been shown to have receptors in male sex organs. Further, vitamin D has been shown to have a positive impact on testosterone levels. And coenzyme Q10 may play a role in maintaining healthy sperm. Imagine a Greek yogurt enhanced with all these extras.

Healthy aging

When the body ages, aches, pains, wrinkles and brown spots all increase. Further, there is a reduction in lean body mass. The metabolic rate decreases as does physical activity, contributing to an overall reduction in energy needs. Protein intake is an important determinant of optimal function and sarcopenia prevention. Sarcopenia is degenerative loss of skeletal muscle mass and strength associated with aging.

Whey proteins have been shown to provide an anabolic advantage over other proteins in promoting muscle. This is believed to be due to the high level of leucine in whey ingredients. It has been shown that of the nine essential amino acids, leucine is the igniter of protein synthesis in the body. Since muscle tissue is metabolically active, while adipose tissue is an energy store, those who replace muscle mass with fat burn fewer calories, which results in weight gain. Thus, sufficient protein intake is key to staying fit as one ages.

Other key anti-aging nutrients include antioxidants to reduce oxidative stress that has been shown to take a toll on the body, inside and out. Collagen can influence skin health by maintaining proper elasticity. Glucosamine and rosehip extract are both associated with alleviating minor aches and pains in the joints and muscles. Resveratrol, the component in red wine that is associated with cardiovascular health, is known to have anti-inflammatory, antioxidant and immune-modulating properties. It has even been shown to improve blood flow to the brain and impact cognitive performance.

Dairy products can deliver all of the nutrients mentioned in this article. A dairy processor can create a point of differentiation by developing foods and beverages that address the specific needs of specific age groups. This strategy might be just what your company needs for longevity in the crowded and competitive marketplace of functional foods. ■

■ Glucerna Hunger Smart Shake, from Abbott Laboratories, is designed to help consumers stick to their weight loss plan. Made with milk protein concentrate, an 11.5-ounce serving contains 15 grams of protein to help manage hunger. A proprietary blend of slowly digestible carbohydrates is said to help minimize blood sugar spikes.