Current AWARENESS

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NDC Research Update

META-ANALYSIS FINDS NO SUPPORT FOR ASSOCIATION OF DAIRY PRODUCT USE AND RISK OF PROSTATE CANCER

Researchers have suggested a possible role for the environment/dietary factors in the cause of prostate cancer, one of the more common cancers in the U.S., Canada, and Western Europe. "Dietary intake of dairy products and calcium has been suggested as a possible risk factor for prostate cancer," state the authors, citing a 2007 report of the American Institute for Cancer Research, which concluded that there was "limited data suggestive of increased risk" based on available ecological and epidemiological reports as well as a possible biological mechanism. Researchers at the University of Southern Carolina and Pennsylvania State University conducted a meta-analysis of 45 observational studies (including 26,769 cases) designed to evaluate the relationship between dietary intake of dairy products, calcium and vitamin D on prostate cancer risk.

Result highlights:

- One randomized trial not incorporated into the pooled analysis of observational studies found that calcium supplementation (1,200 mg/day) was not associated with increased risk of prostate cancer, with suggestion of a protective effect.
- "Cohort studies showed no evidence of an association between dairy or milk intake and risk of prostate cancer."
- In the case-controlled studies, pooled results did not show a significant association between dairy intake and prostate cancer risk.
- When analyzing milk specifically, statistical pooling of data from the cohort studies did not show evidence of a significant association between milk and prostate cancer risk. In the case-controlled studies with data on milk intake, the variation in the proportion of subjects consuming the different types of milk limits evaluation of milk intake and prostate cancer risk.
- When analyzing calcium specifically, statistical analysis of data from the case-controlled studies did not support a significant association between calcium and increased prostate cancer risk.
- Examination of dietary vitamin D as the variable of interest in the observational studies did not show a significant relationship between vitamin D and a risk for prostate cancer.

The authors conclude, "The data from observational studies do not support an association between dairy product use and an increased risk of prostate cancer." [Huncharek M, Muscat J, and Kupelnick B, *Nutrition and Cancer*, 60(4): 421-441, 2008]

FLAVORED MILK CONSUMPTION LINKED TO IMPROVED BODY COMPOSITION IN KIDS AND HEIGHT IN BOYS

Research recently published in the *American Journal of Clinical Nutrition* found that replacing sugar sweetened beverages with three servings of milk a day resulted in greater lean body mass and increased height in children. Ninety-eight overweight and obese Chilean children between the ages of 8-10 were enlisted in a 16-week weight intervention program. Each child was randomly assigned to either the intervention group that was instructed to eliminate sugar sweetened beverages and consume three daily servings (each serving was 200mL or about ¾ cup) of flavored milk or the control group, which received no instruction regarding diet. The children in the milk group were encouraged to take the milk to school to drink with lunch. Body measurements calculated at the conclusion of the study found that replacing sugar sweetened beverages with milk did not change percent body fat, but significantly increased lean body mass, and for boys, increased height. The authors say that their data is consistent with other randomized controlled trials conducted in developed countries indicting that increased consumption of milk and dairy products does not increase body fatness. They conclude, "Replacing the habitual consumption of sugar-sweetened beverages with milk may have beneficial effects on lean body mass and growth in children." [Albala C, et al., *Am J Clin Nutr*, 88: 605-611, 2008]

FDA RELEASES NEW HEALTH CLAIM FOR CALCIUM AND VITAMIN D AND OSTEOPOROSIS

The Food and Drug Administration (FDA) released on September 29 a final rule for health claims on the relationship between calcium and vitamin D and a reduced risk of osteoporosis, in addition to calcium and a reduced risk of osteoporosis. Foods that are excellent sources (20% of the Daily Value or more per reference amount) of calcium and foods that are excellent sources of calcium and vitamin D can now bear claims about the relationship of these nutrients and a reduced risk of osteoporosis.

FDA has approved two versions of the claim. One version is for foods that are excellent sources of calcium only:

- "Adequate calcium throughout life, as part of a well-balanced diet, may reduce the risk of osteoporosis."
- "Adequate calcium as part of a healthful diet, along with physical activity, may reduce the risk of osteoporosis in later life."

Another version is for foods that are excellent sources of calcium and vitamin D:

- "Adequate calcium and vitamin D throughout life, as part of a well-balanced diet, may reduce the risk of osteoporosis."
- "Adequate calcium and vitamin D as part of a healthful diet, along with physical activity, may reduce the risk of osteoporosis in later life."

These claims can be used on packages of reduced-fat, low-fat, and fat-free milk and qualifying yogurt varieties, as well as other food products (e.g., fortified orange juice) that qualify as excellent sources (20% or more of the Daily Value per reference amount) of calcium or calcium and vitamin D. FDA hopes the simplification of the health claim language will increase current usage. To view the full report visit www.fda.gov. [Food and Drug Administration. Final Rule: 21 CFR ∫ 101, Docket no. FDA2004P0205]

AAP RELEASES CLINICAL REPORT DOUBLING THE RECOMMENDED INTAKE OF VITAMIN D FOR INFANTS, CHILDREN AND ADOLESCENTS

The American Academy of Pediatrics (AAP) released a report on October 13, "Prevention of Rickets and Vitamin D Deficiency in Infants, Children, and Adolescents," that doubles the amount of vitamin D the AAP recommends for infants, children, and adolescents to 400 IU per day. The recommendations were revised based on new clinical trials and past recommendations that 400 IU of vitamin D per day can safely be given to children to prevent rickets and may provide additional health benefits. In addition to the prevention of rickets, "New evidence supports a potential role for vitamin D in maintaining innate immunity and preventing diseases such as diabetes and cancer," the report states. This statement replaces a 2003 clinical report from AAP, which recommended a daily intake of 200 IU/day for all infants (beginning in the first two months of life), children, and adolescents. The new recommended daily intake of 400 IU of vitamin D is for all infants, children, and adolescents, beginning *in the first few days* of life. According to the report:

- Babies that are exclusively or partially breastfed should receive a vitamin D supplement until they are drinking at least 32 ounces of formula per day. All infant formula sold in the United States is fortified with at least 400 IU/L of vitamin D.
- Children one year of age and older who are not consuming 400 IU of vitamin D from foods, such as vitamin D fortified milk (voluntarily fortified at 400 IU per quart), should receive supplementation.

To read the full report, visit www.aap.org/new/VitaminDreport.pdf. [Wagner CL, Greer FR, and the Section on Breastfeeding and Committee on Nutrition, Clinical Report: Prevention of rickets and vitamin D deficiency in infants, children, and adolescents, *Pediatrics*, 122(5): 1142-1152, 2008]

A state-of-the-art review article, published in August, confirms the scientific basis for AAP's revision of their vitamin D recommendations for infants, children, and adolescents. The authors say it is questionable whether AAP's previous 2003 vitamin D recommendation of 200 IU/day is sufficient for all breastfed infants regardless of vitamin D status of the mothers during pregnancy, skin pigmentation, use of sunscreen, geographical latitude, clothing habits, or dietary calcium intake. In addition, although 200 IU of vitamin D per day may be sufficient to maintain blood levels of vitamin D (25OHD) above 27.5 nmol/L to prevent rickets, this blood level is not sufficient to prevent all rickets. Therefore, the authors say the goal for vitamin D sufficiency is a blood level of >50 nmol/L, which can be achieved with 400 IU of vitamin D per day and is considered safe. The paper also notes that the Canadian Pediatric Society recommends 800 IU/day of vitamin D for breastfed infants during the winter months because of the high prevalence of vitamin D insufficiency among Canadian mothers and their infants. [Misra M, et al., *Pediatrics,* 122(2): 398-417, 2008]

VITAMIN D SYMPOSIUM PROCEEDINGS

A supplement to the October issue of *Nutrition Reviews* contains the published proceedings of the 22nd Marabou Symposium, "The Changing Faces of Vitamin D," held in Stockholm, Sweden, in June 1-3, 2007. The symposium addresses the importance of vitamin D in a much broader perspective than its role in calcium metabolism. "The remarkable range of the effects of vitamin D relates to our new understanding of both the role of the vitamin D receptor and analyses of what might be considered an optimum vitamin D status in populations exposed to very different diets and levels of sun exposure," the introduction states. Articles consider vitamin D's

role in cell proliferation/differentiation, the immune system, multiple sclerosis, energy metabolism, and in aging and cancer – and include a discussion and summary of the conference. [The Changing Faces of Vitamin D, *Nutrition Reviews*, 66(10 Suppl. 2), October 2008]

VITAMIN D INTAKES AND STATUS ARE LOW IN GERMAN ADULTS

This paper, published in the *European Journal of Clinical Nutrition*, analyzed vitamin D status (blood levels of 25-hydroxyvitamin D) and its determinates and health correlates in a sample of more than 4,000 German adults. Results showed that the average vitamin D intake from both food and supplements for this adult population met only about half the recommended intake (200 IU/day). In addition, moderate (12.5-25 nmol/L) and mild (25-50 nmol/L) vitamin D deficiency was prevalent, with 57% of men and 58% of women with vitamin D levels below 50 nmol/L. Among women 65-79 years, 75% had vitamin D levels below 50 nmol/L, even in the summer months. Factors associated with higher blood levels of vitamin D included season of the year, vitamin D intake from diet and supplements, physical activity, and living in a partnership. "Significantly lower serum 25OHD levels were observed in women with hypertension, cardiovascular diseases and noninsulin-treated diabetes as well as in men with insulin-treated diabetes mellitus compared with nonaffected participants," report the authors. The authors say vitamin D deficiency is a "serious public health problem" in Germany, particularly as the population ages. "Our results demonstrate," they say, "that moderate and mild vitamin D deficiency affects a large proportion of the adult population in Germany, and is already prevalent in younger age groups." [Hintzpeter B, et al., *European Journal of Clinical Nutrition*, 62: 1079-1089, 2008]

DOES VITAMIN D INSUFFICIENCY HAVE A ROLE IN PARKINSON'S DISEASE?

This survey study compared the prevalence of vitamin D deficiency between a group of patients with Parkinson disease (PD) and age-matched healthy controls and patients with Alzheimer disease (AD). Results showed, "Significantly more patients with PD (55%) had insufficient vitamin D than did controls (36%) or patients with AD (41%)." In addition, the average blood level of 25-hydroxyvitamin D (25OHD) in patients with PD was significantly lower than in the AD and control groups (31.9 ng/mL vs. 34.8 ng/mL and 37 ng/mL, respectively). The authors say, "These findings support the previously suggested need for further studies to assess what contribution a low 25(OH)D concentration adds to the risk of developing PD (vs. other neurodegenerative disorders) and to determine whether correction of vitamin D insufficiency and deficiency will improve motor or non-motor symptoms in PD." [Evatt ML, et al., *Arch Neurol,*, 65(10): 1348-1352, 2008]

CALCIUM SUPPLEMENTATION AND KIDNEY STONE RISK REVIEWED

This paper reviews the evidence from the scientific literature as well as from adverse event reports for kidney stone occurrence from pharmaceutical industry trials for bone active agents (employing calcium supplements) to provide a comprehensive evaluation of the influence of calcium on kidney stone risk. Although strong evidence from previous studies has shown that higher calcium intake reduced kidney stone risk, the author felt it was time to reassess kidney stone risk in postmenopausal women because a 2006 report of a small increase in kidney stone risk in the calcium treatment arm of the Women's Health Initiative (WHI) led to a reduction in

U.S. calcium supplement sales. The author explains that "About 74% of kidney stones in North America are composed of calcium oxalate. Increased concentration of either calcium or oxalate in urine will increase stone risk, other things being equal." However, urinary oxalate is a greater risk factor for kidney stones than is urinary calcium. "This is the generally accepted reason why increased calcium intake, despite elevating urine calcium, tends actually to reduce stone risk," explains the author. "The bulk of ingested calcium intake remains unabsorbed in the intestine, where it complexes with oxalate (from food) and prevents its absorption, thus lowering the renal oxalate load." Factors that increase risk of kidney stones include low fluid intake, obesity, hypertension, surgical menopause, high intake of oxalate-containing foods, protein, salt, and low intakes of fiber and phosphate. Upon reviewing the collective evidence, the author says, "Taken in its totality, the available evidence does not support a causal linkage between renolithiasis (kidney stone) risk and calcium intakes of a magnitude likely to be encountered in postmenopausal women, whether that calcium is from diet or supplement. Of all the controlled trials, the WHI stands out as the sole exception, both for its finding of an increase in risk and for the absolute magnitude of apparent stone risk in all its arms." Although it cannot be proven, the author speculates that the kidney stone incidence may have been over-reported as an adverse event in the WHI study. He draws the following practical conclusions: 1) calcium supplementation intake above current recommendations "has little or no value"; 2) calcium supplementation in obese women "should be approached with caution". He also says there is "no reason to modify current recommendations for calcium supplementation with bisphosphonate therapy." [Heaney, RP, *J Am College Nutr*, 27(5): 519-527, 2008]

CALCIUM AND VITAMIN D REVERSES ADVERSE MAMMARY GLAND CHANGES IN MICE INDUCED BY WESTERN STYLE DIET

Researchers at the Strang Cancer Research Laboratory and Memorial Loan-Kettering Cancer Center in New York previously reported that hyperproliferation/hyperplasia of the mouse mammary gland after feeding a Western-style diet decreased after supplementing the animals with calcium and vitamin D3. This study adds additional findings to the previous one by comparing the 6-month effectiveness between calcium and vitamin D-enriched yogurt and calcium and vitamin D supplements. Eighty female C57B1/6 mice were randomly assigned to four different diets for 6 months: 1)AIN-76A control diet (standard mouse chow); 2) Western-style diet (high fat/low calcium and vitamin D)(WD); 3) Western-style diet plus calcium/vitamin D-enriched yogurt (WD_y); and 4) Western-style diet plus calcium /vitamin D (WD_{CaD}). Results showed that feeding a Western-style diet increased abnormal changes in the mouse mammary gland. These changes were normalized by adding the calcium and vitamin D to the diets either through yogurt or supplementation. The authors say, "These findings support a chemopreventive approach to breast cancer with increased vitamin D and calcium." [Kurihara N, et al., *Journal of Medicinal Food*, 11(2): 201-206, 2008]

A SNACK OF LOWFAT YOGURT WITH PLANT STEROLS LOWERS CHOLESTEROL LEVELS

Canadian researchers hypothesized that consuming a carton of yogurt fortified with plant sterols (1.6 g/day) with a meal as opposed to an afternoon snack would lead to more favorable changes in blood lipids without negatively affecting vitamin E (α-tocopherol) or carotenoid levels. They conducted a single blind, randomized counter balanced, crossover, clinical trial among 26 men and women (40-80 years) who had elevated blood lipids. The study consisted of three phases of 30 days each during which the subjects ate a low-fat controlled diet. Each phase

was separated by 4 weeks, during which the subjects ate their usual diet. The diets contained either: 1) a control yogurt or a plant sterol-enriched yogurt consumed 2) with a supper meal, or 3) as an afternoon snack. "The major finding in the present study," report the researchers, "is that PS (plant sterols) provided in a low-fat yogurt matrix lowered total cholesterol levels to greater extent when consumed as a snack compared to when PS were consumed with a meal."

Specifically:

- The PS snack reduced total cholesterol levels significantly by 10.4%, while the PS meal dose decreased total cholesterol to a lesser extent (6.7%) that was not statistically significant.
- There were no differences in total cholesterol to HDL-cholesterol ratio between the baseline and end of each of the three phases and no differences in triglyceride level between the baseline and ending point.
- None of the interventions had an effect on blood levels of α-tocopherol or β-carotene.

The authors conclude, "These results indicate that a single dose of PS in low-fat yogurt, provided as a snack, lowers cholesterol levels but does not alter fat-soluble vitamin or carotenoid concentrations in hyperlipidemic participants." [Rudkowska I, et al., *J Am College Nutr*, 27(5): 588-595, 2008]

NEW 2008 PHYSICAL ACTIVITY GUIDELINES FOR AMERICANS

The U.S. Department of Health and Human Services (HHS) issued this inaugural *Physical Activity Guidelines for Americans* which provides science-based guidance to help Americans aged 6 and older improve their health through appropriate physical activity. The Institute of Medicine, HHS convened a workshop in October 2006 to address whether separate physical activity guidelines were appropriate. The workshop's report, *Adequacy of Evidence for Physical Activity Guidelines Development* (http://www.nap.edu/ catalog.php?record_id=11819), affirmed that advances in the science of physical activity and health justified the creation of separate physical activity guidelines. The content of the *Physical Activity Guidelines* complements the *Dietary Guidelines for Americans,* a joint effort of HHS and the U.S. Department of Agriculture (USDA). Together, the two documents provide guidance on the importance of being physically active and eating a healthy diet to promote good health and reduce the risk of chronic diseases. The primary audiences for the report are policymakers and health professionals. The Guidelines are designed to provide information and guidance on the types and amounts of physical activity that provide substantial health benefits. The report states that health benefits occur for all age groups and every studied racial and ethnic group. However, the Guidelines encourage people to be physically active for any and all reasons that are meaningful for them, not only for health benefits. Weekly amounts of aerobic physical activity are classified into four categories: inactive, low activity, medium activity and high activity. Low amounts of activity provide some benefits; medium amounts provide substantial benefits; and high amounts provide even greater benefits.

The Guidelines take a lifespan approach and provide recommendations for three age groups:

Children and Adolescents

- Children and adolescents should do 60 minutes (1 hour) or more of physical activity daily. This should include vigorous-intensity physical activity at least 3 days a week; muscle-strengthening physical activity on at least 3 days of the week; and bone-strengthening physical activity on at least 3 days of the week.

- It is important to encourage young people to participate in physical activities that are appropriate for their age, that are enjoyable, and that offer variety.

Adults

- Avoid inactivity.
- For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity.
- For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 minutes (5 hours) a week of moderate-intensity, or 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate-and vigorous-intensity activity.
- Adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.

The report states, "Some people (such as postal carriers or carpenters on construction sites) may get enough health-enhancing physical activity on the job to meet the Guidelines."

Older Adults

- Same as above for adults.
- Older adults should do exercises that maintain or improve balance if they are at risk of falling.
- Older adults may need to vary the amount and type of physical activity based on fitness level and health conditions.

"The bottom line," the report states, "is that the health benefits of physical activity far outweigh the risks of adverse events (i.e. injury, heart attack) for almost everyone." View the full report at: http://www.health.gov/paguidelines/pdf/paguide.pdf

USDA LAUNCHES NEW PYRAMID FOR PRESCHOOLERS

Brian Wansink, executive director of USDA's Center for Nutrition Policy and Promotion, introduced MyPyramid for Preschoolers at the American Dietetic Association's Food and Nutrition Conference and Expo in Chicago on Sunday, October 26. This new nutrition tool is part of an ongoing campaign called "Project M.O.M." that he has spearheaded since joining USDA last year. "We have refocused our general advice to everyone and are now honing in on the nutritional gatekeepers who purchase and prepare most of the family food," Wansink said. He believes educating these nutritional gatekeepers—moms, dads or other caregivers—is the most efficient way to transform the way Americans eat.

The new MyPyramid for Preschoolers is intended to help parents make better food choices for preschool children, aged 2 to 5 years—a critical time when food habits and taste preferences are established. Keeping tabs on calories is a bigger reality today than ever before, considering that nearly 15 percent of preschoolers in this country are overweight. The materials take nutrition education to the next level by showing parents and caregivers *how* to implement the information. For example, a clever section titled "phrases that help and hinder," moms/caregivers can learn to reframe their food discussions to be more positive. For example, instead of enforcing a clean plate rule, sample words are provided to help a child recognize when he or she is full, such as "Is your stomach still making its hungry growling noise?" Instead of using phrases that teach your child to eat for your approval or love, such as "If you do not eat one more bite, I will be mad." Access MyPyramid for Preschoolers and related links at www.mypyramid.gov.

In Brief…

Commentary addresses whether the food industry can help address obesity

This commentary published in the *Journal of the American Medical Association* questions whether the food industry can be depended upon to voluntarily address the obesity epidemic. "While visionary CEOs and enlightened food company cultures may exist, society cannot depend on them to address obesity voluntarily, any more than it can base national strategies to reduce highway fatalities and global warming solely on the goodwill of the automobile industry," say the authors. They say it is important to recognize that in a market-driven economy, the food industry acts to maximize profit. This sets up an "irreconcilable conflict" with health-related goals to eat minimally processed foods, which have low profit margins. The authors then delineate what they see as appropriate roles for government, academia, public health organizations, the public, and industry. In their view, the government's role is to establish rigorous standards for nutrition at school, ban food marketing targeted to children, and forbid unsubstantiated health claims on food labels. Academia should investigate nutrition and health and conduct an independent review of industry-sponsored research. Public health organizations should educate and avoid partnerships/product endorsements and other financial ties with industry. The public's role is to make informed food purchases; and the industry's role is to innovate to make healthful food economical, convenient, and tasty. [Ludwig DS and Nestle M, *JAMA*, 300(15): 1808-1811, 2008]

Are energy-dense diets also nutrient dense?

Nutrient density is a central concept of the 2005 Dietary Guidelines which recommends that individuals meet nutrient requirements by promoting consumption of nutrient dense foods. Energy density refers to the amount of energy in a given weight of food and/or beverages. The results of previous studies that have not included beverages in their calculations, have suggested that decreasing the energy density of the diet improves diet quality. The present study was undertaken to assess whether the energy-nutrient association changed when beverages (including nutrient dense beverages such as milk and fruit juice) were included in the calculations – and whether energy dense intakes were also nutrient dense, based on consumption patterns of 440 young adults in Bogalusa, Louisiana. Average nutrient intakes and food group consumption were examined across the energy density tertiles using two calculation methods: 1) food and all beverages excluding water; 2) food and only energy-containing beverages. Using the ETNV (Extended Table of Nutrient Values) database to assess the nutrient composition of foods and beverages consumed by the subjects, results showed that "Energy-dense diets appear to be also nutrient-dense based on the increased fat content that contains essential fatty acids and vitamin E." Diets higher in energy density were associated with a greater meat intake and increased amino acid consumption. The author says, "The data suggest that promoting the consumption of foods that are less energy dense may come with subtle consequences in overall dietary intake of nutrients often forgotten or seen less significant in the diet." [Nicklas TA, et al., *J Am College Nutr*, 27(5): 553-560, 2008]

Slowed regression of mammary tumors in rats fed milk

Researchers in China and Japan used rats whose ovaries had been removed (ovariectimized) to explore the effects of estrogen and other hormones in milk on mice with chemically-induced mammary tumors. A group of rats were given a chemical to induce mammary tumors. After about 12 weeks when tumors had developed, the rats were assigned to one of three groups: 1) ovariectomized and fed rodent diet and water; 2) ovariectimized and fed rodent diet and whole milk replaced water; 3) control group had a sham operation, but ovaries remained intact and

fed rodent diet and water. Changes in location, number, and volume of tumors were monitored. Rats in the control group (not ovariectimized) had tumors throughout the experiment and tumor number and volume increased over time. Tumors in the ovariectimized mice fed water disappeared by week 8 after grouping. Tumor regression occurred more slowly in the ovariectimized rats that drank milk. At autopsy (10 weeks), tumor incidence in the milk group was significantly higher than in the ovariectimized rats drinking water, but significantly lower than that in the control group. The authors attribute the results to higher hormone levels in the rats drinking milk. The authors say the rats drank the human equivalent of 8 liters of milk per day (an amount impossible to consume), and these results cannot be applied to the spontaneous development of breast cancer in humans. [Qin L-Q, et al., *Nutrition and Cancer*, 60(4): 505-510, 2008][As the authors state, this study is not a model for spontaneous breast cancer development in humans as the tumors were chemically induced and involve a different physiological process. Several studies link consumption of dairy foods or dairy food components (i.e., calcium and vitamin D) to a lower risk of breast cancer. DMI staff see Scientific Status Report #4, Cancer and Diet.]

No alterations in fat metabolism seen with a dairy-based calcium supplement in overweight adults

This double-blind, placebo-controlled, randomized crossover experiment investigated the effect of supplementing the diet with 800 mg of a dairy-based calcium supplement per day on energy expenditure and markers of fat metabolism in 10 overweight adults who habitually consumed a low calcium diet. Participants following their habitual low calcium diet were randomly assigned to take a dairy-based calcium supplement (a milk mineral concentrate) or a placebo for 4 weeks. After 4 weeks subjects underwent 7 hours of acute testing of energy expenditure and fat metabolism, after consuming either 400 mg of calcium or placebo and either slow-release caffeine or lactose. Food intake and physical activity were controlled for a 24-hour period. Subjects then continued for another week on their assigned diet, after which they underwent another day of acute testing. After a 10 week washout period during which they consumed their habitual diet, they switched to the opposite treatment. Results showed that resting energy expenditure, fat oxidation, plasma free fatty acid concentrations, and glycerol turnover were similar with or without the calcium supplement. The expression of seven key metabolic genes in subcutaneous fat tissue was not affected by calcium supplementation. The authors say, "The present observations do not support the hypothesis that increasing the calcium intake of overweight or obese low consumers of calcium increases energy expenditure and fat oxidation." [Bortolotti M, et al., *Am J Clin Nutr*, 88: 877-885, 2008]

An accompanying editorial states that all plausible mechanisms explaining how calcium influences energy balance should be evaluated by randomized controlled trials. Based on evidence from previous studies, the author states that "the effect of calcium may be exerted mainly during energy restriction (not energy balance as in the Bortolotti study) and only in persons with a low habitual calcium intake." He concludes that "there is still good evidence for a role of dietary calcium intake in human body weight regulation," and that future studies are needed to further elucidate potential mechanisms. [Astrup A, *Am J Clin Nutr*, 88: 873-874, 2008]

Little evidence that calcium or dairy intake can modify appetite or food intake

Recognizing that "there is some evidence to suggest that calcium or dairy intake may modulate body weight and body fat mass", the authors of this emerging science commentary review the evidence for one potential mechanism, that of appetite and food intake. The paper presents several mechanisms by which calcium may reduce body weight/fat, including increased lipid

oxidation, reduced fat absorption, and reduced food intake/appetite. They conclude that of the limited evidence available to date, none "directly show that dietary calcium alone alters food intake," and there is little support for the suggestion that calcium intake influences appetite-regulating hormones. [Teegarden D and Gunther CW, *Nutr Rev*, 66(10): 601-605, 2008]

Limiting soft drink availability at school may have a limited impact on overall consumption

This cross-sectional, descriptive analysis of children in fifth grade across the U.S. provides nationally representative data on predictors of soft drink consumption. Specifically, the study investigates how availability of soft drinks at elementary schools relates to consumption of soft drinks at school and overall. Results showed:

- "Twenty-six percent of children who have access to soft drinks at school consume them."
- "Those who consume more soft drinks at school, such as low-income and black non-Hispanic children, are more likely to consume more soft drinks overall."
- "Limiting availability of soft drinks at school is associated with a 4% decrease in the rate of any consumption overall."

The authors say, "These findings can serve as a benchmark for future evaluations of the effects of changes in the school food environment on eating behaviors." [Fernandes MM, *J Am Diet Assoc*, 108: 1445-1452, 2008]

Start with the schools to reduced availability of sweetened beverages

The authors of this research editorial begin by examining several lines of evidence to identify the factors that influence childhood obesity. Protective dietary factors for children included being breastfed and eating more fruits, vegetables, dietary fiber, low-fat dairy and calcium-rich foods. Not skipping breakfast was protective. They found that intake of sweetened beverages was the only high-risk dietary practice that was linked to overweight in children. They argue that schools are prime areas to focus policy changes that can influence the development of childhood obesity. Schools can begin by implementing the Institute of Medicine recommendations to eliminate beverages that provide more than 35% of energy and total sugars per portion, they say. They propose that food and nutrition professionals lead the effort to "recommend water and milk as the beverages of choice for children", and "promote sweetened beverage-free environments for children" at school. [Crawford P, et al., *J Am Diet Assoc*, 108(9): 1440-1444, 2008]

Eating breakfast has positive short-term effect on cognitive functioning and alertness

This cross-over trial involving 104 German boarding school students 13-20 years of age evaluated whether breakfast had effects on the cognitive performance and mood of high school students. Half the students received a standardized breakfast, while the other half received no breakfast. Seven days later the treatments were reversed. The researchers measured attention, concentration, and verbal/spatial memory using standardized tests. They measured mood using a self-administered questionnaire. Results showed:

- "Breakfast had no effect on sustained attention among high school students."
- "Visuospatial memory was improved in male students."
- "Self-reported alertness improved significantly in the entire study population."
- "Male students reported feeling more positive after consuming breakfast, compared with the fasting condition."

[Widenhorn-Muller K, et al., *Pediatrics*, 122(2): 279-284, 2008]

Further research needed on the influence of caloric sweeteners on bone health

According to the authors, this is the first systematic review to evaluate the evidence regarding the effect of caloric sweeteners on bone health and potential mechanisms of action. They first discuss several mechanisms whereby soft drink consumption may contribute to poor bone health, such as displacement of milk and other calcium-rich foods (which they say cannot entirely explain the association between soft drink consumption and decreased bone mineral density and fracture), phosphoric acid content of colas, and the caffeine content of soft drinks. After dismissing these factors, they focus the rest of the paper on types of caloric sweeteners such as glucose, sucrose, fructose and high-fructose corn syrup on bone. The authors conclude, "Despite the high intake and change in the type of caloric sweeteners consumed, the existing scientific literature does not appear robust enough to enable a conclusion to be made at this time." They await further research on the role of caloric sweeteners and bone health. [Tsanzi E, Fitch CW, and Tou JC, *Nutr Rev*, 66(6): 301-309, 2008]

Other Publications of Interest

- *Breakfast skipping and body mass index among adolescents in Greece: Whether an association exists depends on how breakfast skipping is defined. [Kialektakou KD and Vranas PBM, J Am Diet Assoc, 108: 1517-1525, 2008]*
- *Global burden of obesity in 2005 and projections to 2030. [Kelly T, et al., International J Obesity, 32: 1431-1437, 2008]*
- *Five-year follow-up of a cognitive-behavioral lifestyle multidisciplinary program for childhood obesity outpatient treatment. [Vignolo M, et al., European J Clin Nutr,62: 1047-1057, 2008]*
- *Genetic and epigenetic contributions to human nutrition and health: Managing genome-diet interactions. [Stover PJ and Caudill MA, J Am Diet Assoc, 108: 1480-1487, 2008]*
- *Bovine lactoferrin supplementation supports immune and antioxidant status in healthy males. [Mulder AM, et al., Nutr Res, 28: 583-589, 2008]*
- *Calcium, vitamin D supplementation, and physical function in the Women's health Initiative. [Brunner RL, et al., J Am Diet Assoc, 108: 1472-1479, 2008]*