

Understanding the role of dairy foods in weight management: a growing body of research has demonstrated that dairy products can help achieve a healthy weight.

Dairy Foods

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Body

Obesity has risen significantly in the United States and is predicted to become the most prevalent public health problem in the United States. Thirty percent of American adults aged 20-74--more than 60 million people--are obese. The number of children and teens who are overweight has tripled since 1980. Sixteen percent of children 6--19 years--more than 9 million--are considered overweight. If weight gain continues at its present rate. 39% of Americans are estimated to be obese in 2008. Overweight and obesity is a major public health concern because excess body fat leads to a higher risk for premature death and for many chronic diseases and conditions including type 2 diabetes, cardiovascular disease, hypertension, stroke, insulin resistance syndrome, gout, osteoarthritis, and some cancers (e.g. colon, endometrial, postmenopausal breast). The total health care costs attributed to obesity-related diseases in 2000 were estimated at \$117 billion. As a result, federal government and state agencies, the food and beverage industry and health professional organizations are desperately seeking ways to reduce the nation's obesity epidemic.

Dairy doesn't make you fat

Experts generally agree that excess energy intake and reduced energy expenditure through less physical activity is responsible for the rise in obesity in the United States. Changes in the environment and in individual behavior that tend to encourage over-consumption of calories and discourage physical activity are driving forces that account for the increased rate of obesity, such as increased availability of energy-dense, nutrient-poor foods and beverages, increased portion sizes, and increased consumption of meals outside the home. Misperceptions about foods and beverages can influence food choices leading to an increase in high calorie, nutrient-poor diets. For example, many individuals who are trying to lose weight eliminate or reduce their intake of dairy foods due to fears about weight gain and misperceptions that milk and other dairy foods are fattening. In a recent survey, 66% of respondents indicated that they do not consume dairy foods regularly because they are trying to lose weight. Yet, numerous studies indicate that recommended intakes of dairy foods are not linked to being overweight or obese. In fact, it has been shown that increased dairy consumption is linked with lower weight and body fat. The recent 2005 Dietary Guidelines Advisory Committee report concluded that there is no evidence that consuming the recommended three servings of milk products a day increases body weight.

Linking weight management with dairy foods--The evidence

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One of the earliest hints that dairy might affect body weight came from a clinical trial studying calcium's effect on lowering blood pressure in obese African American men with low calcium intakes. The researchers found that increasing low calcium intake to 1,000 mg/day by eating two cups of yogurt/day without reducing calories for one year unexpectedly reduced body fat by almost 11 lbs. Since then, numerous, but not all, studies in humans and animal models have demonstrated enhanced weight and/or body fat loss when consuming a calorie-reduced diet containing dairy foods/calcium in recommended amounts.

Observational evidence: Support for dairy foods' beneficial role in weight management comes from several observational studies that evaluated the link between calcium/dairy intake and body weight. One such study, the **Coronary Artery Risk Development in Young Adults** (CARDIA), followed 3,157 adults for 10 years. Among overweight and obese adults, the obesity occurrence and weight gain risk over 10 years was 67% lower in those consuming the most dairy foods versus those consuming the least. Neither the type of dairy product nor its fat content affected the study results. The Quebec Family Study of nearly 500 adults reported that women who consumed less than 600 mg calcium per day had greater body weight and body fat than women who consumed more than 600 mg calcium per day. A similar pattern was observed for body fat in men. Most studies in children and adolescents have also shown either inverse or neutral associations between calcium/dairy foods and body weight and fat. To date, the majority of observational and clinical studies support a beneficial relationship between dairy food intake and lower body weight and body fat. The failure of some studies to support this association may be explained by factors such as high baseline calcium intakes, lack of control of energy intakes, and/or use of normal weight subjects.

Clinical evidence: The first clinical study directly demonstrating that increasing calcium intake from low to recommended levels through dairy foods can accelerate body weight and fat loss was conducted by researchers at the University of Tennessee. Thirty-two obese adults were assigned to one of three reduced-calorie diets (-500 kcal/day below maintenance needs): 1) A low calcium control diet (< 500 rag/day) containing little or no dairy; 2) a diet adequate in calcium provided by calcium supplements (1,200-1,300 rag/day); and 3) a diet adequate in calcium provided by 3 servings of milk, cheese or yogurt (1,200-1,300 rag/day). After 24 weeks, subjects lost 14.5, 18.9, and 24.4 lbs of body weight in the control, calcium supplement, and dairy diet group, respectively. Similar significance was observed for body fat loss, with the greatest loss occurring in subjects on the dairy diet. These results provided the first direct human evidence indicating that increasing dietary calcium intake from low levels to recommended levels of intake can accelerate body weight and body fat loss in obese subjects when consuming a diet moderately reduced in calories. Most important for the dairy industry, the intake of dairy foods had a substantially greater effect on both weight and fat loss compared to an equivalent amount of supplemental calcium. These findings have been confirmed by the Tennessee researchers in two subsequent studies, i.e., a 24-week study in obese African Americans and a 12-week study using yogurt as the sole dairy food. These studies also discovered that subjects on high dairy diets lost significantly less lean body mass than those on low dairy/calcium diets, suggesting a favorable preservation of muscle during weight loss.

Three conditions common to these studies that may be important for demonstrating the favorable effects of adequate dairy/calcium (1,100-1,300 rag/day) on body weight and fat loss include: 1) a low baseline calcium intake of <600 mg/day; 2) overweight and obese subjects; and 3) moderate caloric restriction (-500 kcals/day). Additional research is needed to verify the importance of these factors for dairy foods to accelerate weight/fat loss.

How does it work?

Studies in human fat cells and experimental animals have suggested possible mechanisms whereby calcium/dairy food intake may modulate energy and fat metabolism. Briefly, low calcium diets have been shown to increase the calcium-regulating hormones, calcitriol (the active form of vitamin D) and parathyroid hormone, which increases calcium levels in fat cells. Research suggests that intracellular calcium plays an important role in regulating fat metabolism by increasing fat storage and inhibiting fat breakdown in fat cells. Conversely, a high calcium diet inhibits the calcium regulating hormones, thereby decreasing intracellular calcium, which in turn, decreases fat accumulation and increases the release of fat from fat cells.

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Preliminary data from a recent human study that evaluated caloric expenditure in people given an adequate calcium diet provided by dairy foods has demonstrated significantly greater 24-hour fat oxidation compared to a low calcium diet. Other mechanisms that also may play a role in reducing body weight and fat include greater fecal fat loss with higher calcium diets and/or decreased food intake via satiety effects induced by dairy bioactive peptides. Clearly, additional research is needed in these areas to elucidate the mechanism(s) by which high calcium/dairy food diets exert their effects on body composition.

A body of science is rapidly emerging that supports a relationship between dairy food/calcium consumption and effects on body weight and fat. Clinical research in overweight and obese adults has found greater weight and fat loss with consumption of three servings of milk, cheese or yogurt daily as part of a moderately reduced-calorie diet and adequate in calcium versus a reduced-calorie diet with little or no dairy. The types of dairy foods consumed in these clinical trials included full-fat, reduced-fat, low-fat, and fat-free milk, cheese or yogurt products as subjects were allowed choice within the reduced caloric goals.

Summary: Dairy Management, Inc., in conjunction with numerous dairy industry partners, currently promote a nutrition education and marketing campaign called the 3-A-DayTM of Dairy that promotes the benefits of dairy directly to the consumer. A key initiative of the 3-A-DayTM of Dairy program is the 3-A-DayTM of Dairy Weight Loss initiative. Dairy manufacturers and retailers can participate in the 3-A-DayTM of Dairy Weight Loss initiative that allows utilization of the 3-A-DayTM "Burn more fat, Lose weight" logo on qualifying products and in advertising as long as applicants complete a standardized application and a 3-A-Day of Dairy Weight Loss Trademark Agreement.

To learn more about the 3-A-Day of Dairy program, visit www.3aday.org or contact Sherie Swiontek, Dairy Management, Inc., 847/627-3314. sheries@rosedmi.com.

PETER HUTH, DIRECTOR, REGULATORY AND RESEARCH TRANSFER, AND GREGORY MILLER, SENIOR V.P. NUTRITION AND PRODUCT INNOVATION ARE WITH THE NATIONAL DAIRY COUNCIL, A PART OF DAIRY MANAGEMENT INC., ROSEMONT, IL.

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