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DAIRY FOODS: MYTHS & REALITIES

SUMMARY

Health professional organizations and government agencies recognize the nutritional and health benefits of milk and other dairy foods. USDA's *Food Guide Pyramid* recommends two to three servings/day of Milk Group foods for everyone two years of age and over. Despite overwhelming support for dairy foods, myths linking milk/dairy intake to an array of possible health problems arise. Some special interest groups with political or ideological agendas promote these myths in an effort to discourage consumption of animal products. Myths regarding dairy foods not only are unfounded but, if acted upon, can also jeopardize health. This *Digest* identifies some current myths related to dairy foods and reviews the scientific facts dispelling these myths.

The myth that minority groups such as African Americans should avoid milk and other dairy products because of lactose intolerance is not supported by scientific evidence. Lactose maldigestion (i.e., low levels of the intestinal enzyme lactase necessary to digest lactose or milk's sugar) is higher among some minority groups such as African Americans than Caucasians. However, studies demonstrate that lactose maldigesters can consume the recommended number of Milk Group servings by using a few simple dietary strategies (e.g., consuming milk with meals, yogurt with active cultures, and aged cheeses). Avoiding or limiting dairy foods, the major source of calcium, is particularly serious for minorities such as African Americans who are already at a disproportionately high risk of calcium-related chronic diseases such as hypertension, stroke, and colon cancer. New research indicates that risk of osteoporosis among African Americans is higher than previously assumed.

Likewise, the myth that intake of dairy products increases the risk of heart disease is unfounded. On the contrary, the DASH (Dietary Approaches to Stop Hypertension) eating plan including low fat dairy products may help to reduce the risk of heart disease by its beneficial effect on blood pressure, blood lipids, and blood homocysteine levels. Findings from epidemiological studies demonstrate that intake of dairy foods or dairy food nutrients (e.g., calcium, potassium, magnesium) is inversely associated with stroke.

There is no persuasive evidence to support the myth that consumption of milk and other dairy products causes cancer. On the contrary, intake of dairy foods may reduce the risk of some cancers, notably colon cancer. Moreover, several dairy food components such as vitamin D, calcium, conjugated linoleic acid (CLA), and sphingolipids may potentially protect against cancer.

Also unsupported by scientific evidence are claims that early exposure to cow's milk increases the risk of Type 1 diabetes; that calcium-rich foods such as milk should be avoided to reduce kidney stones; and that milk causes mucus production in the throat. Although some infants (2% to 7%), particularly if genetically predisposed or fed cow's milk before one year of age, may develop cow's milk allergy, this condition usually disappears by two to three years of age and is rare in adults.

Myths related to dairy foods raise unfounded health concerns about these foods. Conversely, a justifiable health concern is the low intake of milk and dairy products in the United States. Numerous studies support dairy's beneficial role in health and disease prevention. D

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INTRODUCTION

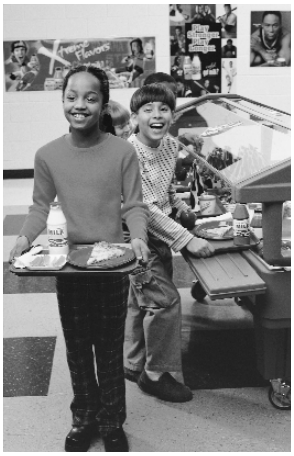
Despite the recognized nutritional and health benefits of dairy products (1), myths about these foods periodically arise. Recently, special interest groups with political or ideological agendas (e.g., animal rights groups that advocate elimination of all animal products from the diet) have been campaigning to discourage the public from consuming milk and other dairy products. A common tactic employed by milk critics is to raise health concerns about dairy foods based on myths. For example, a frequently promoted myth is that minority groups should avoid dairy foods because of lactose intolerance. Other myths erroneously link intake of milk/dairy foods to heart disease, some cancers, diabetes, kidney stones, and additional health problems.

These well-publicized inaccurate statements about milk and other dairy products have not gone unnoticed by the health community (2-6). Examination of the charges leveled against milk led health professionals to conclude that such claims are without merit. On the contrary, intake of milk and other dairy products, which are a major source of calcium and contain other essential nutrients, helps to reduce the risk of a number of chronic diseases (1).

This *Digest* reviews the scientific evidence dispelling some of the myths advanced by anti-dairy groups. As reviewed in previous *Digests*, recognizing the ploys used by special interest groups and the signs of junk science (7), as well as gaining an understanding of the strengths and weaknesses of different types of research studies (8), can help dispel myths about dairy foods. It is important to recognize that dairy foods contribute to a healthful diet.

MYTH: *Minority groups such as African Americans should avoid milk and other dairy products because of lactose intolerance.*

In reality, it is unnecessary and potentially unhealthy for individuals with lactose maldigestion or intolerance to eliminate milk or other dairy products from their diet (1,9-12). Lactose maldigestion (also called lactase non-persistence) is a normal genetically-determined decline in lactase, the intestinal enzyme necessary to digest lactose or milk sugar. Lactose intolerance is the occurrence of gastrointestinal symptoms associated with ingestion of lactose-containing foods.



Minorities and others with lactose maldigestion can adopt strategies, such as drinking milk with meals or eating aged cheeses, that allow them to comfortably consume dairy products, the major dietary source of calcium.

Lactose maldigestion is higher among many minority groups than among those of northern or western European origin (13). An estimated 100% of Native Americans, 90% of Asian Americans, 80% of African Americans, 53% of Mexican Americans, and 15% of whites are lactose maldigesters (13). However, lactose maldigestion does not necessarily result in lactose intolerance (symptoms) or prevent minorities from consuming recommended intakes of dairy foods (1,10-12). Results of double-blind, randomized cross-over trials demonstrate that individuals with lactose maldigestion can comfortably consume one cup of milk with a meal or two cups of milk if consumed in divided doses with meals (1,9-12,14). In a recent study of African American adolescent girls, 82% of whom were lactose maldigesters, intake of 1,200 mg calcium/day from dairy foods did not cause any symptoms of intolerance (14). Further, gradually increasing intake of lactose-containing foods such as dairy foods actually improved the girls' tolerance to lactose (14).

For lactose intolerant individuals, dietary strategies to improve tolerance to dairy foods include: adjust the amount of lactose consumed at any one time; drink milk with a meal or snack; try yogurts with live active cultures and aged cheeses; and increase daily intake of lactose-containing foods slowly (1,9-12). In addition, commercial over-the-counter aids such as lactase tablets, lactase preparations, lactose-free milk, and prehydrolyzed milk are available for individuals who have difficulty tolerating even small amounts of lactose.

Milk and other dairy products are the major dietary source of calcium, providing 72% of the calcium available in the U.S. food supply (15). Low consumption of dairy foods and consequently low calcium intake among minority groups, particularly African Americans, may be explained in part by perceived or real lactose intolerance (9-11). Avoiding or limiting dairy foods is particularly serious for African Americans,

many of whom are at a disproportionately high risk of calcium-related chronic diseases such as hypertension, stroke, and colon cancer (10-12,16). New research indicates that risk of osteoporosis among African Americans is greater than previously believed (17).

MYTH: *Drinking milk leads to heart disease and stroke.*

There is no scientific evidence that consuming milk or other dairy foods as recommended leads to heart disease or stroke (1,18). On the contrary, including milk and other dairy products in the diet may help to reduce the risk for these diseases.

Dietary guidelines to reduce heart disease recommend a population-wide decrease in total fat, saturated fat, and cholesterol (19). To meet these guidelines, emphasis on consuming foods low in these nutrients is advised. Reduced fat and low fat milks and other dairy products are available (20). Although milk fat is an important source of saturated fatty acids, its content of stearic and short and medium chain fatty acids (which do not raise blood cholesterol levels) may minimize the expected increase in blood cholesterol levels. In addition, individuals differ in their blood lipid responses to dietary fat because of genetics (21,22). In some individuals, a low fat diet may potentially increase the risk of cardiovascular disease (21,22). Dairy fat contains several components such as CLA (conjugated linoleic acid) and sphingolipids that might protect against heart disease (1,23,24).

Studies indicate that dairy food intake is not associated with increased risk of heart disease or adverse effects on blood lipid levels (25-27). A recent 25-year prospective study of nearly 6,000 men living in Scotland found that men who drank between 2/3 and 2-2/3 cups/day of milk (presumably whole milk) were at lower risk of death from heart disease or from all causes than men who consumed less than 2/3 cups of milk per day (25). Other research also indicates that dairy food intake can be increased without any changes in blood lipid levels (26,27). In fact, an eating plan containing lowfat dairy products may help to reduce the risk of heart disease (28,29).

The DASH (Dietary Approaches to Stop Hypertension) eating plan including low fat dairy products may help to reduce the risk of heart disease by its beneficial effect on blood pressure, blood lipid levels, and blood homocysteine.

The government-sponsored DASH study demonstrated that consumption of a low fat diet rich in lowfat dairy products and fruits and vegetables (i.e., DASH diet) significantly and quickly reduced blood pressure, an important risk factor for heart disease and stroke (28,29). Milk's nutrients such as calcium, potassium, and magnesium are believed to contribute to its blood pressure-lowering effect (30). The DASH diet, which includes lowfat dairy foods, lowers risk for heart disease as a result of its beneficial effect on blood pressure (28,29), blood lipids (31) and blood homocysteine levels (32). Researchers estimate that adoption of the DASH diet has the potential to reduce heart disease by 15% and stroke by 27% (28), and that this diet's influence on blood homocysteine reduces heart disease risk by an additional 7 to 9% (32). The American Heart Association guidelines recommend 2-4 servings of lowfat milk products as part of a heart healthy diet (19).

A recent review of the literature indicates that consumption of dairy products is associated with reduced risk of stroke, which accounts for 17% of cardiovascular disease (33). Prospective studies of dairy food consumption and stroke incidence link intake of milk and dairy products with reduced risk of stroke (34,35). For example, in the Honolulu Heart Program, which followed subjects for up to 22 years, men of Japanese ancestry who were nonmilk drinkers experienced twice the rate of thromboembolic stroke as men who consumed two or more cups of milk/day (34). Calcium, potassium, and magnesium – minerals abundant in milk – are associated with reduced risk of stroke (35). The FDA has approved a health claim linking foods that are good sources of potassium with reduction of high blood pressure and stroke (36). Lowfat and nonfat milks as well as some yogurts qualify to make this claim. Clinical trials are needed to substantiate epidemiological evidence of dairy's benefit on stroke.

MYTH: *Intake of dairy products causes some cancers.*

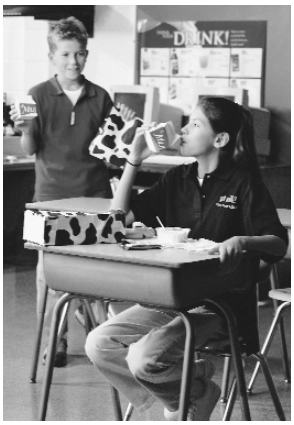
There is no credible evidence that consumption of milk or other dairy products plays a role in the etiology of

cancers such as those of the prostate and breast. In fact, some studies indicate that dairy intake may reduce the risk of cancer (1).

Findings from epidemiological studies that link dairy/calcium intake with prostate cancer are mixed (37,38). Epidemiological studies, by their very design, indicate associations, not cause-and-effect relationships (8). According to a recent review of risk factors for prostate cancer by the American Council on Science and Health, "drinking milk is *not* an established – or even reasonably suggestive – risk factor for prostate cancer. In fact, the evidence for a role of milk is merely speculative" (39).

Similarly, there is no conclusive evidence that intake of any specific food or dairy food in particular plays a causal role in breast cancer (40). In fact, some studies suggest that intake of milk may possibly protect against breast cancer (41-43). Researchers speculate that milk's beneficial effect on risk of breast cancer may be due to calcium or other components in milk such as CLA (42).

Intake of milk/dairy products has been associated with reduced risk of other types of cancer, particularly colon cancer (44). According to a randomized, single-blinded controlled trial, when patients with a history of developing polyps (i.e., noncancerous growths) in the colon increased their intake of food sources of calcium, specifically low fat dairy foods such as lowfat milk, risk for colon cancer was reduced (44). In a recent case-control study of more than 14,000 men aged 40 to 84 years, intake of lowfat milk or calcium from dairy foods was associated with a lower risk of colorectal cancer, especially in those at highest risk, than among non-milk drinkers (45). Several components in milk/dairy foods such as vitamin D, calcium, CLA, sphingolipids, and butyric acid may potentially protect against cancer (1,46,47). Much remains to be learned about the role of diet in general and specific foods such as dairy foods in various types of cancer.



Myths about milk and other dairy products not only are unfounded but, if acted upon, can also jeopardize health.

MYTH: *Early exposure to cow's milk increases the risk of Type 1 diabetes.*

There is no persuasive scientific evidence that intake of cow's milk in childhood causes Type 1 or insulin-dependent diabetes (48-54). Type 1 diabetes results from an autoimmune destruction of the insulin-producing beta cells of the pancreas. An interaction between genetic susceptibility and an environmental trigger is thought to be involved in the development of this disease (48-51). Critical reviews of the scientific evidence fail to support the hypothesis that milk proteins, particularly bovine serum albumin, may initiate a response that destroys pancreatic beta cells in genetically susceptible children, thus causing Type 1 diabetes (48-51). Some researchers suggest that impaired immune function in cells lining the intestine may lead to Type 1 diabetes and that genetically predisposed individuals may exhibit enhanced immunity to dietary proteins in general (55).

The Juvenile Diabetes Foundation International has issued a position paper concluding that "there is no compelling scientific evidence at this time that supports the claim that drinking cow's milk increases the risk of developing Type 1 diabetes in children or adults" (51). The American Academy of Pediatrics recommends breast-feeding or iron-fortified cow's milk-based formulas during the first year of life, with transition to whole milk after 12 months of age (56). Health professionals do not advise that infant feeding recommendations be changed or that cow's milk be avoided during childhood to reduce the risk of Type 1 diabetes (48-51).

MYTH: *Calcium-rich foods such as milk should be avoided to reduce the risk of kidney stones.*

In reality, the opposite appears to be true. Adequate intake of calcium from calcium-rich foods such as milk may actually reduce the risk of kidney stones in most people (57-61). Traditionally,

patients with calcium oxalate stones, the most common type, have been advised to reduce calcium intake. However, there is no evidence that intake of calcium, even up to 2 g/day from foods such as dairy products, promotes calcium oxalate kidney stones (57,58). In fact, restricting intake of calcium-rich foods by healthy people may increase their risk for stones (61).

Epidemiological studies demonstrate that a calcium intake of 1,000 to 1,300 mg/day from dairy foods is associated with reduced risk of kidney stones (57,58). According to a recent five-year randomized trial among 120 men with hypercalciuria (high levels of calcium in the urine) and a history of recurrent calcium oxalate stones, a diet containing adequate amounts of calcium (1,200 mg/day), along with reduced amounts of animal protein and salt, was more effective in preventing recurrent stones than a traditional low calcium diet (400 mg/day) (62).

Increasing calcium intake reduces urinary excretion of oxalate, which is found in rhubarb, teas, nuts, beans, spinach, and chocolate (60,62). Urinary oxalate excretion is more important in the formation of calcium oxalate stones than is urinary calcium. Increasing calcium intake decreases the intestinal absorption and urinary excretion of oxalate (60,62). Low calcium intake may not only increase risk of calcium oxalate kidney stones, but also may lead to negative calcium balance and low bone density or osteoporosis in stone formers (61,63).

MYTH: *Consuming cow's milk contributes to milk allergies and causes mucus production in the throat.*

Milk allergy, an adverse immunological reaction to one or more of cow's milk proteins, is uncommon (64-67). Although parents may assume that a child's symptoms are due to milk allergy (68), cow's milk allergy affects only about 2% to 7% of infants when tested under controlled conditions (64-67). Genetic predisposition and too early exposure to cow's milk (i.e., when digestive and immune processes are immature) can increase an infant's susceptibility to cow's milk allergy. In general, sensitivity to cow's milk protein usually disappears by two to three years of age (64,65). In adults, cow's milk allergy is rare. The American Academy of Pediatrics recommends breastfeeding as the optimal source of nutrition for infants through the first year of life or longer (67). For infants with milk allergy or at risk for this condition who are not breast fed, hypoallergenic formulas (i.e., extensively hydrolyzed or free amino acid-based) are available (67).

A justifiable health concern related to milk and other dairy products is the low intake of these foods compared to the recommended 2 to 3 servings/day.

There is no scientific evidence to support the myth that consuming cow's milk increases mucus production in the throat and that avoiding milk will alleviate respiratory symptoms such as those commonly associated with colds (69-71). Nor is there any evidence that consuming milk contributes to breathing difficulties due to bronchoconstriction in adults with asthma (72).

CONCLUSION

Milk and other dairy products are safe, healthful, nutritious foods that make a substantial contribution to the American diet (1,15). Intake of milk and other dairy products improves the overall nutritional quality of the diet (73). As one researcher stated, "a diet devoid of dairy products will often be a poor diet not just in respect to calcium, but for many other nutrients as well" (74).

Myths about foods such as milk/dairy products can confuse consumers and jeopardize health. The most widely promulgated allegations that intake of cow's milk leads to various health problems not only are unfounded, but their seriousness or the strength of evidence is also greatly exaggerated (6). Conversely, a justifiable health concern is the low intake of milk/dairy foods in the United States (75). To help ensure that myths surrounding dairy foods do not compromise intake of these healthful foods, the public needs to learn to critically evaluate allegations and to assess the value of foods within the context of the total diet. D

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Coming Next Issue:

WEIGHT CONTROL: AN EMERGING BENEFICIAL ROLE FOR DAIRY

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