

# Science Summary

## Dairy and Cardiovascular Disease



### Overview

Dairy foods such as milk, cheese and yogurt are foundational foods in healthy dietary patterns. The dairy group contributes important shortfall nutrients, including calcium, vitamin D and potassium to the American diet. Low-fat and fat-free dairy foods are part of the Dietary Guidelines for Americans (DGA) and American Heart Association (AHA) recommended healthy dietary patterns for Americans 2 years and older. An extensive body of research indicates that consuming dairy foods is associated with multiple health benefits, and several meta-analyses and prospective studies published since 2015 conclude that consuming dairy foods is not linked to increased risk for cardiovascular disease (CVD) or coronary artery disease (CAD) and is associated with reduced risk for stroke. This research provides further support for the importance of including low-fat or fat-free dairy foods in healthy dietary patterns.

### Healthy dietary patterns can help lower risk for CVD and decrease public health costs

CVD is the leading cause of death in the U.S., accounting for nearly 23 percent of all deaths in 2018.<sup>1</sup> CVD includes several diseases of the heart and blood vessels that can impair heart function, while CAD and stroke are specific types of CVD that affect the arteries that feed the heart or brain.<sup>2</sup> Annual estimates of health care costs and lost productivity due to CVD and stroke in the U.S. exceed \$300 billion.<sup>3</sup> The 2020 DGA states that a healthy dietary pattern is associated with beneficial outcomes for CVD and recommends 3 daily servings of low-fat or fat-free dairy foods for those 9 years and older, 2½ servings for children 4-8 years and 2 servings for children 2-3 years as part of the Healthy U.S.-Style Dietary Pattern.<sup>4</sup> The DGA also recommends 1⅓ to 2 servings of whole- and reduced-fat dairy foods for toddlers 12-23 months who no longer consume human milk as part of the Healthy U.S.-Style Dietary Pattern.<sup>4</sup> Small amounts of yogurt and cheese are recommended as complementary foods for infants 6 to 12 months, depending on developmental readiness.<sup>4</sup> The AHA also recommends that adults consume low-fat or fat-free dairy foods, depending on energy needs, as part of its 2016 Guidelines on Lifestyle Management to Reduce Cardiovascular Risk.<sup>5</sup>

### Eating dairy foods is not linked to higher risk of CVD, CAD or stroke

Total dairy intake as well intake of specific dairy foods have been linked with reduced risk of adverse cardiometabolic outcomes. Total dairy intake is not associated with increased risk for CVD, CAD or stroke and may be associated with reduced risk according to results of one systematic review,<sup>6</sup> 5 meta-analyses,<sup>7-11</sup> 9 systematic reviews and meta-analyses<sup>12-20</sup> and 11 prospective cohort studies.<sup>21-31</sup> Some studies also found that eating cheese and yogurt was linked to a reduced risk of CVD outcomes.<sup>8,18</sup> This Science Summary highlights the results of these studies.

## Growing body of evidence indicates eating dairy foods is not linked to CVD risk

A 2016 systematic review that rates quality of evidence found that high-quality evidence indicates cheese consumption is not associated with increased risk for CVD, and moderate-quality evidence indicates total dairy food intake, as well as yogurt intake, is not associated with increased risk for CVD.<sup>6</sup> A systematic review and meta-analysis of 27 studies reporting 8,648 cases of CVD found inverse associations between total dairy intake and risk of CVD.<sup>32</sup> A systematic review and meta-analysis of 22 prospective cohort studies with data from 91,057 participants and follow-ups ranging from 8 to 26 years found that low-fat dairy food and cheese intake were associated with a reduced risk of stroke and that consuming cheese was also associated with a reduced risk of coronary heart disease.<sup>33</sup> Total dairy intake was linked with a reduced risk of CVD in women in a 2019 meta-analysis,<sup>19</sup> and a second meta-analysis of 15 prospective cohort studies on cheese and health outcomes found that eating cheese was associated with a lower risk for total CVD.<sup>10</sup> Additional meta-analyses including 30 prospective cohort studies showed significantly decreased CVD risk<sup>8</sup> and a 4% reduction in risk of stroke, ischemic heart disease and CVD mortality<sup>18</sup> linked with consuming fermented dairy foods such as yogurt.

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## Prospective evidence finds dairy food consumption is not linked to increased risk for CAD

Evidence from prospective cohort studies indicates that consuming dairy foods is not associated with increased risk for CAD and eating specific dairy foods like cheese may decrease risk. Results of a systematic review of prospective research on dairy and chronic diseases, including CAD, indicate that total dairy food intake is not linked with increased risk for CAD, based on high-quality evidence.<sup>6</sup> This review also found that moderate-quality evidence indicates that drinking milk or eating cheese or yogurt is not linked to increased risk for CAD, and the authors concluded that “there is no evidence that the consumption of any form of dairy product is detrimentally associated with the risk of any cardiovascular-related clinical outcome.”<sup>6</sup> Two meta-analyses published since then report similar results. A meta-analysis on the relationship between dairy foods and cardiometabolic disease found that total dairy (15 studies) and milk (13 studies) intakes were not associated with CAD,<sup>34</sup> and a meta-analysis of 15 prospective cohort studies on cheese and CVD-related health outcomes found that cheese consumption was associated with a 14 percent lower risk for CAD.<sup>10</sup> Similarly, a large meta-analysis of 31 prospective cohort studies of dairy intake and CVD in over one million participants also indicated that cheese intake was associated with a reduced risk of CAD.<sup>16</sup> Finally, a systematic review of randomized controlled trials found that consuming dairy foods may exert a protective effect or no effect on cardiovascular risk factors, including reduced total cholesterol and increased high-density lipoprotein (HDL) cholesterol, though dairy intake did slightly increase low-density lipoprotein (LDL) cholesterol and triglycerides.<sup>35</sup> More research is needed to clarify these results.

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## Total dairy food consumption as well as cheese and yogurt consumption linked to lower risk for stroke

Total dairy food consumption is linked with a reduced risk for stroke,<sup>6,20,32</sup> according to systematic reviews and meta-analyses published since 2015. Consuming specific dairy foods like cheese<sup>10</sup> and milk was also either not linked with stroke or linked with lower risk of stroke.<sup>6,12,16,34,36</sup> A 2016 systematic review concluded that total dairy food consumption, as well as cheese consumption, is associated with reduced risk for stroke.<sup>6</sup> This review also found that consuming milk, yogurt and whole-fat dairy is not associated with increased risk for stroke, based on moderate-quality evidence.<sup>6</sup> Systematic reviews and meta-analyses from 2017 and 2018 also reported inverse associations

between total dairy intake and risk of stroke.<sup>20,32</sup> Another systematic review and meta-analysis of 18 prospective cohort studies found consuming yogurt, butter and total dairy were not associated with risk for stroke, and drinking 200 grams per day of milk (245 grams milk = one 8-ounce cup) was associated with a 7 percent lower risk for stroke.<sup>36</sup> A meta-analysis from 2018 echoed this conclusion, also indicating that increasing milk intake by 200 grams per day was associated with an 8% lower risk of stroke.<sup>34</sup> Results of three additional meta-analyses indicated that cheese consumption was linked with a reduced risk of stroke: one reported that cheese consumption was associated with a 10 percent lower risk for stroke,<sup>10</sup> one found cheese consumption decreased stroke risk by 7 percent<sup>12</sup> and a final meta-analysis found that both total dairy and cheese intake were associated with a reduced risk of stroke.<sup>16</sup>

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