Dairy products

No. 2023/02Be, The Hague, February 7, 2023

Background document to the advisory report:
Dutch dietary guidelines for people with atherosclerotic cardiovascular disease
No. 2023/02e, The Hague, February 7, 2023

Health Council of the Netherlands

Contents

1 Introduction

This background document belongs to the advisory report *Dutch dietary guidelines for people with atherosclerotic cardiovascular disease* (ASCVD).[1] It describes the methodology for the search, selection and evaluation of the literature regarding the relationship between dairy products consumption and health outcomes in people with ASCVD. It also describes the scientific evidence on this topic and the conclusions that have been drawn by the council's Committee on Nutrition.

1.1 Definition of dairy products

This background document describes the scientific evidence regarding dairy products intake. Dairy products include milk and food products made of milk, such as yogurt and cheese.[2] Butter is excluded from the definition of dairy products (similar to the approach taken for the *Dutch dietary guidelines 2015*[3]), as it is included in the food group of fats and oils.

1.2 Dairy recommendation and intake in the Netherlands

The Health Council of the Netherlands included a guideline for dairy product consumption in the *Dutch dietary guidelines 2015*, which is as follows: 'Take a few portions of dairy products daily, including milk or yogurt'.[3]

The average daily dairy products intake of the Dutch adult population is 321 (women) to 374 (men) grammes according to the most recent *Dutch National Food Consumption Survey*.[4]

2 Methodology

2.1 Questions

The Committee aimed to answer the following question: What is the relationship (effect or association) of relatively higher dairy products consumption compared to no or relatively lower dairy products consumption with health outcomes in people with ASCVD?

2.2 Target group

The target group of the current advisory report is people with ASCVD. The committee defines this group as people with clinically established coronary heart disease (CHD, consisting of acute coronary syndromes [myocardial infarction and unstable angina], stable angina and revascularisation procedures such as percutaneous coronary intervention [PCI] and coronary artery bypass grafting [CABG]), peripheral arterial disease (PAD) or cerebrovascular disease (consisting of stroke and transient ischemic attack). In the target population, atherosclerosis in the coronary arteries, aorta, iliac and femoral arteries, and cerebral arteries is the main underlying pathological process. Groups with a high risk (but no manifestation) of ASCVD, such as people with hypertension or elevated LDL cholesterol levels, fall outside this definition. Also, the target group of this advice does not include people with heart failure (except when those people also suffer from ASCVD). A detailed description of the target group of this advisory report is provided in the background document *Methodology for the evaluation of the evidence.*[5]

In the present background document, the Committee also considered studies performed in people with cardiovascular disease (CVD) in general (not further specified) because it assumes that the majority of this population will have ASCVD.

2.3 Nutritional topics

The Committee searched for studies into the effects or associations of dairy products, including subtypes such as yogurt and cheese, on or with health outcomes. The Committee aimed to distinguish between high-fat, semi-fat and low-fat dairy products, where possible.

In addition, the Committee preferred to include studies in which dairy products consumption was measured after the occurrence of the ASCVD event, and preferably at least 6 months after the event in order to capture the habitual post-event intake and long-term effects of this exposure, since people may change their dairy products consumption habits because of an ASCVD event.

2.4 Health outcomes

The Committee selected the following health outcomes for this advisory report (further explained in the background document *Methodology for the evaluation of the evidence*[5]):

- short-term surrogate outcomes:
  - body weight
  - systolic blood pressure
  - low-density lipoprotein (LDL) cholesterol
  - estimated glomerular filtration rate (eGFR)
  - glycated haemoglobin (HbA1c) and fasting blood glucose
- long-term health outcomes:
  - all-cause mortality
  - morbidity and/or mortality from total CVD, CHD, stroke (cerebrovascular disease), heart failure, atrial fibrillation, type 2 diabetes, chronic obstructive pulmonary diseases (COPD), total cancer, breast cancer, colorectal cancer, lung cancer, dementia, depression
  - subtypes of CHD, such as myocardial infarction, angina pectoris and revascularisation procedures (i.e., coronary artery bypass surgery and percutaneous coronary intervention)

For cohort studies, the Committee included only studies in the above-described category named long-term health outcomes.

2.5 Selection and evaluation of the literature and drawing conclusions

2.5.1 Search and selection of studies

A detailed description of the approach used by the Committee for selecting and evaluating the scientific literature is provided in the background document *Methodology for the evaluation of the evidence*.[5] In short, the Committee aimed to base its evaluation of scientific literature on systematic reviews (SRs), including meta-analyses (MAs) and pooled analyses, of randomised controlled trials (RCTs) and/or prospective cohort studies examining the relationship of dairy products intake with the above-mentioned health outcomes in people with ASCVD. To identify such publications, the Committee searched PubMed and Scopus in January 2022. The search did not yield any publications relevant for the Committee's evaluation. The search strategy is provided in Annex A. Next, the Committee searched for reports of individual studies into dairy product consumption among people with ASCVD. The Committee was aware of two recently published articles of the Dutch Alpha-omega cohort via its network.[6,7] These studies addressed the association between dairy products consumption and the risks of type 2 diabetes, all-cause mortality and cardiovascular mortality in people with

a previous myocardial infarction (MI). Four additional prospective cohort studies relevant for the Committee's evaluation were selected via the literature searches on other nutritional topics for the current advisory report (meat, alcohol).[8-11] The reference lists of the selected publications and articles that cited these publications were checked, which yielded no more relevant studies. In addition, existing guidelines for people with ASCVD were checked, which also did not yield extra publications.

2.5.2 Drawing conclusions

A detailed description of the approach used for drawing conclusions is provided in the background document *Methodology for the evaluation of the evidence*.[5] In short, the Committee drew conclusions on (the certainty of) the evidence regarding the relationships between dairy product intake and health outcomes in people with (prior) ASCVD, based on the number of studies, number of participants and number of cases that contributed to the evaluation. Also, it took the quality of the studies, in particular the risk of bias, and the heterogeneity between studies into account. The Committee used the decision tree (presented in the background document *Methodology for the evaluation of the evidence*[5]) as a tool to support consistency in drawing conclusions.

3 Associations of dairy consumption

In this chapter, the Committee describes the scientific evidence from cohort studies for associations of dairy product consumption with health outcomes in people with ASCVD.

Tables 1a-c summarise the results and characteristics of prospective cohort studies that provided evidence regarding the associations of dairy product consumption with health outcomes in people with ASCVD.

Table 1a Summary of associations of diary product consumption and health outcomes in people with atherosclerotic cardiovascular disease: prospective cohort studies of Cruijsen et al.[6] and Iestra et al.[8]

Aspect	Cruijsen et al. 2021[6]	Iestra et al. 2006[8]
Study duration[a]	12 years[b]	10 years
Primary disease	CHD	CHD
Cohort name	Alpha Omega Cohort	HALE project
Exposure (dairy products)	Total dairy intake categorised into: <200, ≥200–300, ≥300–400, ≥400 g/d. Subtypes of dairy products were also assessed, such as yogurt and hard cheeses.	Total dairy product consumption categorised into below or above energy adjusted median of the healthy study population of the HALE project; median NR.
Dietary assessment method	FFQ at baseline assessing frequency of consumption of 42 items on dairy products, grouped by fat content. Alcohol intake during the previous month. The FFQ was validated against a diet history method (Pearson correlation coefficient 0.83 for total energy intake; for dairy intake NR)	Validated dietary history method
Number of participants; number of cases	4365 participants; All-cause mortality: 2035 Cardiovascular mortality: 903 IHD mortality: 558 Stroke mortality: 170	426 participants; All-cause mortality: 247
Strength of the association: HR (95%CI)[b]	Highest versus lowest category of intake (for total dairy: ≥400 vs <200 g/d; for yogurt: ≥50 vs < 25 g/d; for high-fat milk: any versus zero): ALL-CAUSE MORTALITY:	Above versus below median intake: ALL-CAUSE MORTALITY: 0.83 (0.64–1.09) Subgroup analyses:

	Total dairy: 1.01 (0.90, 1.15) Yogurt: 0.87 (0.78, 0.96) High-fat milk: 1.30 (1.13, 1.49) CARDIOVASCULAR MORTALITY: Total dairy: 0.97 (0.81, 1.17) Yogurt: 0.86 (0.74, 0.99) High-fat milk: 1.06 (0.85, 1.32) IHD MORTALITY: Total dairy: 1.01 (0.80, 1.27) Yogurt: 1.01 (0.83, 1.22) High-fat milk: 1.19 (0.91, 1.54) STROKE MORTALITY Total dairy: 0.81 (0.54, 1.21) Yogurt: 0.83 (0.59, 1.17) High-fat milk: 0.99 (0.59, 1.66) For hard cheeses, total fermented dairy, total milk and low-fat milk no associations were found with any of the health outcomes.	Men: 0.73 (0.53–1.07) Women: 1.29 (0.74–1.34) Northern Europe: 0.68 (0.47–0.97) Southern Europe: 1.07 (0.68–1.67)
Study population	People aged 60-80 years with a history of MI; body weight status: 20% obese, medication: antihypertensive medication (90%), lipid-modifying medication (86%); men (79%) and women (21%); Europe (The Netherlands)	People ≥70 years with a history of MI; body weight status: 21% obese; medication: NR; men (67%) and women (33%); Europe

Abbreviations: CHD: coronary heart disease; CI: confidence interval; d: day; FFQ: food frequency questionnaire; HALE: Healthy Ageing: a Longitudinal Study in Europe; HR: hazard ratio; IHD: ischemic heart disease; MI: myocardial infarction; NR: not reported.

[a] Value represents mean or median follow-up, unless indicated otherwise.

[b] Statistical models adjusted for the following confounders: Cruijsen et al.: For the all-cause mortality and cardiovascular outcomes: age, sex, energy intake, physical activity, smoking, alcohol intake, diabetes, obesity, intakes of whole grains, refined grains, potatoes, fruit, vegetables, total red and processed meat, sugar-sweetened beverages, coffee, tea; Iestra et al.: study (SENECA/FINE), gender, age, years of education, BMI, history of diabetes, history of stroke, smoking, physical activity, alcohol consumption.

Table 1b Summary of associations of diary product consumption and health outcomes in people with atherosclerotic cardiovascular disease: prospective cohort studies of Trichopoulou et al.[11] and Stewart et al.[10]

Aspect	Trichopoulou et al. 2007[11]	Stewart et al. 2016[10]
Study duration[a]	6.7 years	3.7 years
Primary disease	CHD	CHD
Cohort name	EPIC-Elderly study	STABILITY trial
Exposure (dairy products)	Dairy product consumption analysed per 243 g/d increment	Dairy product consumption Categorised into never or rarely; once a week; several times a week; 1-2 servings/d; ≥ 3 servings/d
Dietary assessment method	Self- or interviewer-administered food frequency or quantitative dietary questionnaire	Self-administered FFQ
Number of participants; number of cases	2671 participants; All-cause mortality: 467	15482 participants; MACE[d]: 1588
Strength of the association: HR (95%CI)[c]	ALL-CAUSE MORTALITY: Per 243 g/d increment: 1.10 (1.00–1.21)	MACE: Per 1 category increase: 0.97 (0.93, 1.02)
Study population	People ≥60 years with previous MI; body weight status: NR; medication: NR; men and women; Europe	People ≥60 years with stable CHD[e]; body weight status: 38% ≥30 kg/m^2; medication: NR; men and women; 39 countries in Asia or South Africa (17%), Eastern Europe (25%), North America (26%), South America and Mexico (9%), Western Europe and Oceania (24%)

Abbreviations: CHD: coronary heart disease; CI: confidence interval; d: day; EPIC: European Prospective Investigation into Cancer and Nutrition; FFQ: food frequency questionnaire; HR: hazard ratio; MI: myocardial infarction; NR: not reported; STABILITY: stabilization of atherosclerotic plaque by initiation of darapladib therapy;

[a] Value represents mean or median follow-up, unless indicated otherwise.

[b] Value represents the (approximate) maximum follow-up.

[c] Statistical models adjusted for the following confounders: Trichopoulou et al.: sex, age, diabetes mellitus at baseline, previous treatment for hypertension, previous treatment for hypercholesterolemia, waist to hip ratio, BMI, educational achievement, smoking status, physical activity at work, physical activity at leisure, alcohol intake, total energy intake; Stewart et al.: treatment group, age, sex, smoking, markers of disease severity (prior myocardial infarction, prior coronary revascularization, multi-vessel disease confirmed by angiography, polyvascular disease and eGFR <60mls/min/m2), cardiovascular risk factors (history of hypertension, diabetes mellitus, HDL and LDL cholesterol, body mass index and total self-reported physical activity), geographic region , world bank country income level and education;

[d] MACE was defined as non-fatal MI, non-fatal stroke, or mortality from a cardiovascular cause. Statistical models were stratified by country.

[e] Stable CHD was defined as prior MI, prior coronary revascularization, or multi-vessel CHD. Besides stable CHD, participants also had to meet one of the following cardiovascular risk criteria: age ≥60 years,

diabetes mellitus requiring pharmacotherapy, HDL-cholesterol < 1.03 mmol/L, current or previous smoker, significant renal dysfunction, or polyvascular disease defined as CHD and cerebrovascular disease or CHD and peripheral arterial disease.

Table 1c Summary of associations of diary product consumption and health outcomes in people with atherosclerotic cardiovascular disease: prospective cohort studies of Mozaffarian et al. 2007[9] and Jacobo Cejudo et al. 2021[7]

Aspect	Mozaffarian et al. 2007[9]	Jacobo Cejudo et al. 2021[7]
Study duration[a]	3.2 years	3 years[b]
Primary disease	CHD	CHD
Cohort name	GISSI-Prevenzione study	Alpha Omega Cohort
Exposure (dairy products)	Cheese (not further defined), categorised into regularly versus never.	Total dairy intake categorised into: <200, ≥200–300, ≥300–400, ≥400 g/d. Subtypes of dairy products were also assessed, such as yogurt and hard cheeses
Dietary assessment method	Questionnaire into the usual consumption of several food items.	FFQ at baseline assessing frequency and quantity of alcohol intake during the previous month. The FFQ was an extended version of a reproducible and biomarker-validated FFQ (Pearson correlation coefficient between FFQ and dietary history method 0.83 for total energy intake; for dairy intake NR)
Number of participants; number of cases	8291 participants; Diabetes: 998	3401 participants; Type 2 diabetes: 186
Strength of the association: HR (95%CI) [c]	DIABETES: Regular consumption versus never: 1.05 (0.73, 1.52)	TYPE 2 DIABETES: Highest versus lowest category of intake: Total dairy: 1.32 (0.88, 1.99) Total milk: 1.10 (0.76, 1.58) Low-fat milk: 1.08 (0.76, 1.54) High-fat milk: 0.80 (0.47, 1.38) Hard cheeses: 0.92 (0.63, 1.36) Total yogurt: 1.06 (0.76, 1.48) Low-fat yogurt: 1.19 (0.86, 1.64) Total fermented dairy: 0.95 (0.63, 1.42) Dairy desserts: 1.06 (0.73, 1.54)
Study population	People with recent (≤3 months) myocardial infarction; average BMI: 26.3 ± 3.4; mediation: ACE	People aged 60-80 years with a history of MI; body weight status: 20% obese; medication:

	inhibitors: 45%, Beta-blockers: 47%, diuretics: 8%, cholesterol-lowering medication: increased from 5% at start of the study to 45% at 3.5 years.	antihypertensive medication (89%), lipid-modifying medication (87%); men (80%) and women (20%); Europe (The Netherlands)

Abbreviations: ACE: angiotensin-converting enzyme; BMI: body mass index; CHD: coronary heart disease; CI: confidence interval; d: day; FFQ: food frequency questionnaire; GISSI: Gruppo Italiano per lo Studio della Sopravvivenza nell'Insufficienza Cardiaca; HR: hazard ratio; MI: myocardial infarction; NR: not reported.

[a] Value represents mean or median follow-up, unless indicated otherwise.

[b] Value represents the (approximate) maximum follow-up.

[c] Statistical models adjusted for the following confounders: Mozaffarian et al.: age, sex, BMI, physician-diagnosed hypertension, previous acute myocardial infarction, current smoking, former smoking, days from acute myocardial infarction to enrolment, NYHA class, angina, positive exercise stress test, exercise capacity, inability to undergo exercise testing, fish oil supplements, vitamin E supplements, ACE inhibitor, beta-blocker, diuretic, lipid-lowering medication, Mediterranean diet score, wine consumption, coffee consumption; Jacobo Cejudo et al.: age, sex, energy intake, physical activity, smoking, educational level, alcohol intake, family history of diabetes, BMI, whole grains, refined grains, fruit, vegetables, red and processed meat, sugar-sweetened beverages, coffee, tea, fish and salt from foods.

Conclusions:

There is too little research to draw conclusions regarding the associations of total dairy product consumption with all-cause mortality, CVD, CHD, stroke and type 2 diabetes in people with CHD.

The following considerations were made by the Committee, following the steps of the decision tree, to come to this conclusion:

Regarding all-cause mortality, there are three prospective cohort studies that reported on the associations with total dairy product consumption in people with a previous MI. This excludes a conclusion with strong evidence (for which at least five studies are needed). The results of the studies were not entirely consistent, with two studies showing no association and one study showing a borderline statistically significantly increased all-cause mortality risk. Three studies provide too little evidence to draw conclusions of no association and/or inconclusive evidence. Therefore, the Committee concluded there was too little evidence to draw a conclusion on the association between total dairy product consumption and the risk of all-cause mortality among people with CHD.

Regarding CVD morbidity or mortality, there are two prospective cohort studies that addressed the associations with total dairy product intake among people with a previous MI or stable CHD. Regarding CHD and stroke, there is one prospective cohort study that addressed the association between total dairy intake and the risk of mortality due to ischemic heart disease or stroke among people with a previous MI. Regarding type 2 diabetes, there is one prospective cohort study that addressed the association

with total dairy intake among people with a previous MI. One or two studies per health outcome provide too little evidence to draw conclusions regarding the associations between total dairy product intake and CVD, CHD, stroke and type 2 diabetes.

There is too little research to draw conclusions regarding the associations of consumption of dairy subtypes such as cheese and yogurt with all-cause mortality and CVD, CHD, stroke, and type 2 diabetes in people with CHD.

The following considerations were made by the Committee, following the steps of the decision tree, to come to this conclusion:
There is one prospective cohort study that addressed the association between dairy subtypes, such as yogurt and cheese, and the risk of all-cause mortality and cardiovascular outcomes in people with a previous MI.
There are two prospective cohort studies that addressed the association between cheese consumption and the risk type 2 diabetes, and one prospective cohort study that addressed the association between other dairy subtypes, such as yogurt, and the risk of type 2 diabetes in people with a previous MI.
These studies provide too little evidence to base conclusions on regarding dairy subtypes.

Explanation:
The studies that addressed all-cause mortality as outcome are described below. For this outcome, there were three cohort studies identified by the Committee. For the remaining outcomes (in particular type 2 diabetes, CVD morbidity or mortality) one or two cohort studies were identified per outcome, which, according to the Committee's decision tree, provides too little evidence to base conclusions on. Therefore, the studies that contributed to these outcomes are not described below.

The study by Cruijsen et al.[6] showed that consuming more than 50 g of yoghurt per day compared to less than 25 g per day was associated with a reduced risk of all-cause mortality (13%) and CVD mortality (14%) in Dutch people who survived a MI. In addition, an increased risk of 30% of all-cause mortality was found for any intake of high-fat milk (≥3.5% fat) compared with zero intake. No association was found between total dairy, total fermented dairy, milk (total milk or low-fat milk) or (hard) cheese and all-cause mortality, CVD mortality, ischemic heart disease mortality or stroke mortality. During the first 40 months of ~12 years follow-up, these people participated in a trial with omega-3 fatty acid supplementation, which found no effect on CVD and CHD mortality.
The majority of participants experienced the MI more than ~1.5 years before inclusion into the study, and therefore the Committee considered the estimated dairy product consumption is likely representative for the long-term habitual (post event) intake.

Dietary intake was measured with an FFQ. The Pearson correlation coefficient for energy intake assessed with this FFQ compared with a dietary history method measured over the same period was 0.83. Median daily dairy product intakes were 39 g for total yogurt (33 g for low-fat yogurt), 17 g for hard cheeses, 55 g for total fermented dairy, 88 g for total milk (52 g for low-fat milk), and 273 g for total dairy.
The data-analyses took into account relevant confounders such as total energy intake and several food groups, including fruits, vegetables, whole grains, refined grains, processed meat, sugar-sweetened beverages, coffee, tea, fish, and salt from foods (except for cheese). Treatment allocations and the use of medication were not included in the multivariable adjusted model. Subgroup analyses showed that the inverse association between yoghurt and CVD mortality was stronger among people without obesity than in people with obesity, and that the association tended to be slightly stronger in women than in men.
The authors reported that funders of the study were not involved in the design, data collection, analysis or manuscript preparations. The authors reported no conflicts of interest.

Iestra et al.[8] found no association between total dairy consumption and all-cause mortality in people with a previous MI from nine different countries in Europe. This may, among other things, be due to the small number of participants and cases and due to the analysed categories of dairy consumption. The analysis was performed in the data from the HALE project, which combined data from participants from the SENECA and FINE cohort studies. Diagnosis of MI was self-reported (SENECA) or medically confirmed (FINE).
Food consumption data were collected by trained dieticians using a validated dietary history method. The results of the validation were not described by the authors. The report does not specify how long after the MI diagnosis food consumption data were collected. However, given the participants were a selection from the general (elderly) population, the Committee expects the dairy product consumption was assessed outside the acute phase of the MI event.
The presented associations were not adjusted for energy intake or other dietary components, except for alcohol intake. However, dairy consumption was adjusted for energy intake by dividing the daily intake by the individual's total energy intake and multiplying it by the sex and study population-specific median of energy intake. Cut-off points for dietary components used for the data-analyses were based on sex-specific medians of the healthy population of the HALE project. The cut-off value was not reported. Median dairy product intakes of the study population were 383 g/d and 258 g/d for men and 267 g/d and 242 g/d for women, depending on whether participants originated from Northern or Southern Europe, respectively. These may give a general indication of the cut-offs.

No notable funding sources of the study were reported. Conflicts of interest of the authors were not reported.

Trichopoulou et al.[11] found a borderline statistically significant 10% increased risk for all-cause mortality per 243 g increase of dairy products consumption among people with a previous MI from nine different countries in Europe. The analysis was performed in data from the EPIC study. Data from participants who were 60 years or older were included in the EPIC-Elderly project. For this analysis only data from participants included in the EPIC-Elderly project who also survived a previous MI were used.
The mean dairy consumption was 341 ± 251 g/d for men and 354 ± 235 g/d for women.
Dairy consumption was measured using food frequency questionnaires or quantitative dietary questionnaires. These questionnaires were validated in each study centre, but the results of the validation were not reported by the authors.
Dairy product consumption was measured within one year preceding enrolment. Since the participants were a selection from the general (elderly) population, the Committee expects dairy consumption was assessed outside the acute phase of the MI event.
The presented association was adjusted for energy and alcohol consumption but not for other food categories.
No notable funding sources of the study were reported. Conflicts of interest of the authors were not reported.

3.1 Summary of conclusions

The Committee's conclusions regarding associations of dairy product consumption with health outcomes in people with ASCVD are summarised in Table 2.

Table 2 Overview of conclusions regarding the associations of dairy product consumption with health outcomes in people with ASCVD

Health outcome[a]	Types of dairy products	Conclusion
All-cause mortality	total dairy; total fermented dairy; total milk; low-fat milk; high-fat milk; yoghurt; cheese	Too little research
CVD morbidity or mortality	total dairy; fermented dairy; total milk; low-fat milk; high-fat milk; yoghurt; cheese	Too little research
CHD mortality	total dairy; fermented dairy; total milk; low-fat milk; high-fat milk; yoghurt; cheese	Too little research
Stroke mortality	total dairy; fermented dairy; total milk; low-fat milk; high-fat milk; yoghurt; cheese	Too little research
Type 2 diabetes	total dairy; cheese, total milk, low-fat milk, high-fat milk, total yogurt, low-fat yogurt, fermented dairy	Too little research

Abbreviations: CVD: cardiovascular disease; CHD: coronary heart disease.
[a] The table contains the health outcomes for which (relevant) studies were found. For the health outcomes that are not listed in the table, no (relevant) studies were found.

References

1 Health Council of the Netherlands. *Dutch dietary guidelines for people with atherosclerotic cardiovascular disease*. The Hague: Health Council of the Netherlands, 2023.

2 Gezondheidsraad. *Zuivel - Achtergronddocument bij Richtlijnen goede voeding 2015*. Den Haag: Gezondheidsraad, 2015; publicatie nr. A15/32.

3 Health Council of the Netherlands. *Dutch dietary guidelines 2015*. The Hague: Health Council of the Netherlands, 2015; publication no. 2015/26E.

4 van Rossum CTM, Buurma-Rethans EJM, Dinnissen CS, Beukers MH, Brants HAM, Dekkers ALM, et al. *The diet of the Dutch. Results of the Dutch National Food Consumption Survey 2012-2016*. Bilthoven: National Institute for Public Health and the Environment (RIVM), 2020; report no. 2020-0083.

5 Health Council of the Netherlands. *Methodology for the evaluation of evidence. Background document to Dutch dietary guidelines for people with atherosclerotic cardiovascular disease.* The Hague: Health Council of the Netherlands, 2023.

6 Cruijsen E, Jacobo Cejudo MG, Kupers LK, Busstra MC, Geleijnse JM. *Dairy consumption and mortality after myocardial infarction: a prospective analysis in the Alpha Omega Cohort*. Am J Clin Nutr 2021; 114(1): 59-69.

7 Jacobo Cejudo MG, Cruijsen E, Heuser C, Soedamah-Muthu SS, Voortman T, Geleijnse JM. *Dairy Consumption and 3-Year Risk of Type 2 Diabetes after Myocardial Infarction: A Prospective Analysis in the Alpha Omega Cohort*. Nutrients 2021; 13(9): 3146.

8 Iestra J, Knoops K, Kromhout D, de Groot L, Grobbee D, van Staveren W. *Lifestyle, Mediterranean diet and survival in European post-myocardial infarction patients*. Eur J Cardiovasc Prev Rehabil 2006; 13(6): 894-900.

9 Mozaffarian D, Marfisi R, Levantesi G, Silletta MG, Tavazzi L, Tognoni G, et al. *Incidence of new-onset diabetes and impaired fasting glucose in patients with recent myocardial infarction and the effect of clinical and lifestyle risk factors*. Lancet 2007; 370(9588): 667-675.

10 Stewart RA, Wallentin L, Benatar J, Danchin N, Hagstrom E, Held C, et al. *Dietary patterns and the risk of major adverse cardiovascular events in a global study of high-risk patients with stable coronary heart disease*. Eur Heart J 2016; 37(25): 1993-2001.

11 Trichopoulou A, Bamia C, Norat T, Overvad K, Schmidt EB, Tjonneland A, et al. *Modified Mediterranean diet and survival after myocardial infarction: the EPIC-Elderly study*. Eur J Epidemiol 2007; 22(12): 871-881.

Annexes

Annex A Search strategy

PubMed

(“Coronary disease” [MeSH] OR “Acute coronary syndrome” [MeSH] OR “Angina pectoris” [MeSH] OR “Coronary artery disease” [MeSH] OR “Myocardial infarction” [MeSH] OR “Peripheral arterial disease” [MeSH] OR “Intermittent claudication” [MeSH] OR “Stroke” [MeSH] OR “Brain ischemia” [MeSH] OR “Cerebrovascular disorders” [MeSH] OR “Percutaneous coronary intervention” [MeSH] OR “Coronary artery bypass” [MeSH] OR “Coronary disease” [TIAB] OR “Coronary heart disease” [TIAB] OR “Acute coronary syndrome” [TIAB] OR “Angina pectoris” [TIAB] OR “Angina” [TIAB] OR “Ischemic heart disease” [TIAB] OR Ischaemic heart disease [TIAB] OR Coronary artery disease [TIAB] OR “Coronary Arteriosclerosis” [TIAB] OR “Myocardial infarction” [TIAB] OR “Heart attack” [TIAB] OR “Peripheral arterial disease” [TIAB] OR “Peripheral vascular disease” [TIAB] OR “Intermittent claudication” [TIAB] OR “Stroke” [TIAB] OR “Acute stroke” [TIAB] OR “Cerebrovascular Apoplexy” [TIAB] OR “Apoplexy” [TIAB] OR “Ischemic stroke” [TIAB] OR “Ischaemic stroke” [TIAB] OR “Hemorrhagic stroke” [TIAB] OR “Haemorrhagic stroke” [TIAB] OR “Cerebrovascular accident” [TIAB] OR “Acute cerebrovascular accident” [TIAB] OR “Cerebrovascular stroke” [TIAB] OR “Brain vascular accident” [TIAB] OR “Brain ischemia” [TIAB] OR “Cerebral ischemia” [TIAB] OR “Cerebral stroke” [TIAB] OR “Brain accident” [TIAB] OR “Brain infarction” [TIAB] OR “Cerebral infarction” [TIAB] OR “Transient ischemic attack” [TIAB] OR “TIA” [TIAB] OR “Cerebrovascular*” [TIAB] OR “Subarachnoid haemorrhage” [TIAB] OR “Intracerebral hemorrhage” [TIAB] OR “Intracranial hemorrhages” [TIAB] OR “Coronary revascularization” [TIAB] OR “Percutaneous coronary intervention” [TIAB] OR “Coronary artery bypass graft surgery” [TIAB] OR “Percutaneous transluminal coronary angioplasty” [TIAB] OR “Percutaneous transluminal angioplasty” [TIAB] OR “Coronary angioplasty” [TIAB] OR “Atherosclerotic cardiovascular disease” [TIAB] OR “Carotid artery disease” [TIAB] OR “CHD” [TIAB] OR “ACS” [TIAB] OR “IHD” [TIAB] OR “CAD” [TIAB] OR “MI” [TIAB] OR “AMI” [TIAB] OR “PAD” [TIAB] OR “CVA” [TIAB] OR “CVAs” [TIAB] OR “TIA” [TIAB] OR “PCI” [TIAB] OR “CABG” [TIAB] OR “PTCA” [TIAB] OR “PTA” [TIAB] OR “ASCVD” [TIAB])

AND

(“dairy products"[MeSH Terms] OR dairy[tiab] OR milk*[tiab] OR "Yogurt"[Mesh] OR yogurt[tiab] OR yoghurt[tiab] OR cheese*[tiab] OR butter[tiab] OR buttermilk[tiab] OR cream[tiab] OR ice-cream[tiab] OR curd*[tiab] OR porridge[tiab] OR custard*[tiab] OR pudding*[tiab])

AND
(“Systematic review”[publication type] OR “Meta-analysis”[publication type] OR “Review Literature as Topic”[MeSH] OR “review”[TIAB] OR "meta-analysis"[TIAB] OR “meta analysis”[TIAB] OR “metaanalysis”[TIAB] OR “quantitative review”[TIAB] OR “quantitative overview”[TIAB] OR “Systematic Reviews as Topic”[MeSH] OR “systematic review”[TIAB] OR “systematic overview”[TIAB] OR “methodologic review”[TIAB] OR “methodologic overview”[TIAB] OR “individual participant data”[TIAB] OR “individual patient data”[TIAB] OR “IPD”[TIAB] OR “individual-level data”[TIAB] OR “pooled analysis”[TIAB] OR “pooled analyses”[TIAB] OR “multi-center study”[TIAB] OR “multi-cohort study”[TIAB])

Limit: from 2000

Scopus

TITLE-ABS("Coronary disease") OR TITLE-ABS("Acute coronary syndrome") OR TITLE-ABS("Angina pectoris") OR TITLE-ABS("Coronary artery disease") OR TITLE-ABS("Myocardial infarction") OR TITLE-ABS("Peripheral arterial disease") OR TITLE-ABS("Intermittent claudication") OR TITLE-ABS(Stroke) OR TITLE-ABS("Brain ischemia") OR TITLE-ABS("Cerebrovascular disorders") OR TITLE-ABS("Percutaneous coronary intervention") OR TITLE-ABS("Coronary artery bypass") OR TITLE-ABS("Coronary heart disease") OR TITLE-ABS(Angina) OR TITLE-ABS("Ischemic heart disease") OR TITLE-ABS("Ischaemic heart disease") OR TITLE-ABS("Coronary Arteriosclerosis") OR TITLE-ABS("Heart attack") OR TITLE-ABS("Peripheral vascular disease") OR TITLE-ABS("Acute stroke") OR TITLE-ABS("Cerebrovascular Apoplexy") OR TITLE-ABS(Apoplexy) OR TITLE-ABS("Ischemic stroke") OR TITLE-ABS("Ischaemic stroke") OR TITLE-ABS("Hemorrhagic stroke") OR TITLE-ABS("Haemorrhagic stroke") OR TITLE-ABS("Cerebrovascular accident") OR TITLE-ABS("Acute cerebrovascular accident") OR TITLE-ABS("Cerebrovascular stroke") OR TITLE-ABS("Brain vascular accident") OR TITLE-ABS("Brain ischemia") OR TITLE-ABS("Cerebral ischemia") OR TITLE-ABS("Cerebral stroke") OR TITLE-ABS("Brain accident") OR TITLE-ABS("Brain infarction") OR TITLE-ABS("Cerebral infarction") OR TITLE-ABS("Transient ischemic attack") OR TITLE-ABS(TIA) OR TITLE-ABS(Cerebrovascular*) OR TITLE-ABS("Subarachnoid haemorrhage") OR TITLE-ABS("Intracerebral hemorrhage") OR TITLE-ABS("Intracranial hemorrhages") OR TITLE-ABS("Coronary revascularization") OR TITLE-ABS("Percutaneous coronary intervention") OR TITLE-ABS("Coronary artery bypass graft surgery") OR TITLE-ABS("Percutaneous transluminal coronary angioplasty") OR TITLE-ABS("Percutaneous transluminal angioplasty") OR TITLE-ABS("Coronary angioplasty") OR TITLE-ABS("Atherosclerotic cardiovascular disease") OR TITLE-ABS("Carotid artery disease") OR TITLE-ABS(CHD) OR TITLE-ABS(ACS) OR TITLE-ABS(IHD) OR TITLE-ABS(CAD) OR TITLE-ABS(MI) OR TITLE-ABS(AMI)

OR TITLE-ABS(PAD) OR TITLE-ABS(CVA) OR TITLE-ABS(CVAs) OR TITLE-ABS(TIA) OR TITLE-ABS(PCI) OR TITLE-ABS(CABG) OR TITLE-ABS(PTCA) OR TITLE-ABS(PTA) OR TITLE-ABS(ASCVD)

AND
TITLE-ABS(“dairy products") OR TITLE-ABS(dairy) OR TITLE-ABS(milk*) OR TITLE-ABS(yogurt) OR TITLE-ABS(yoghurt) OR TITLE-ABS(cheese*) OR TITLE-ABS(butter) OR TITLE-ABS(buttermilk) OR TITLE-ABS(cream) OR TITLE-ABS(“ice-cream”) OR TITLE-ABS(curd*) OR TITLE-ABS(porridge) OR TITLE-ABS(custard*) OR TITLE-ABS(pudding*)

AND
TITLE-ABS-KEY ("Systematic review") OR TITLE-ABS-KEY ("Meta analysis") OR TITLE-ABS (review) OR TITLE-ABS (meta-analysis) OR TITLE-ABS (metaanalysis) OR TITLE-ABS ("quantitative review") OR TITLE-ABS ("quantitative overview") OR TITLE-ABS ("systematic overview") OR TITLE-ABS ("methodologic review") OR TITLE-ABS ("methodologic overview") OR TITLE-ABS("pooled analyses") OR TITLE-ABS("pooled analysis") OR TITLE-ABS("multi-center study") OR TITLE-ABS("multi-cohort study")

Limit: from 2000

The Health Council of the Netherlands, established in 1902, is an independent scientific advisory body. Its remit is “to advise the government and Parliament on the current level of knowledge with respect to public health issues and health (services) research...” (Section 22, Health Act).
The Health Council receives most requests for advice from the Ministers of Health, Welfare and Sport, Infrastructure and Water Management, Social Affairs and Employment, and Agriculture, Nature and Food Quality. The Council can publish advisory reports on its own initiative. It usually does this in order to ask attention for developments or trends that are thought to be relevant to government policy.
Most Health Council reports are prepared by multidisciplinary committees of Dutch or, sometimes, foreign experts, appointed in a personal capacity. The reports are available to the public.

This publication can be downloaded from www.healthcouncil.nl.

Preferred citation:
Health Council of the Netherlands. Dairy products. Background document to Dutch dietary guidelines for people with atherosclerotic cardiovascular disease.
The Hague: Health Council of the Netherlands, 2023; publication no. 2023/02Be.