



September 2026

Dairy & heart health



Cardiovascular diseases (CVD) remain the **leading cause of death in the EU**, with many risk factors modifiable through diet.



Dairy consumption is not associated with CVD risk and may offer protective effects in some cases. Fermented dairy products, particularly yogurt and cheese, are consistently linked to **favourable cardiometabolic outcomes**.



Health effects of foods depend on the whole **food matrix** (i.e. the actual food consumed) rather than the presence of individual nutrients (e.g. saturated fat)

1. Understanding cardiovascular diseases

Cardiovascular disease (CVD) is an umbrella term encompassing all diseases of the heart and blood vessels, including coronary artery disease, cerebrovascular disease (e.g., 'stroke'), peripheral artery disease, and heart failure. Coronary heart disease (CHD) is among **the most prevalent forms** and can precipitate acute clinical events such as myocardial infarction (e.g., 'heart attack').

Coronary heart disease (CHD), also called coronary artery disease, occurs when plaque (a combination of fat, cholesterol, calcium*, and other substances found in the blood) builds up in your arteries. The plaque reduces the amount of oxygen-rich blood getting to your heart, which can cause chest pain (also called angina). Plaque can also lead to blood clots, which block blood flow and are the most common cause of a heart attack. (1)

Over the past 50 years, CVD mortality has declined, but cardiovascular events like heart attacks and strokes remain by far the **leading cause of death** in the EU, accounting for around **1 in 3 of all deaths** and impacting the lives of some 62 million people who live with CVD. More broadly, **CVD accounts for 37% and 31% of all deaths in women and men respectively in the EU**. (2)

* To be noted that the calcium in plaques comes from biological processes within the artery wall, not from calcium from food.

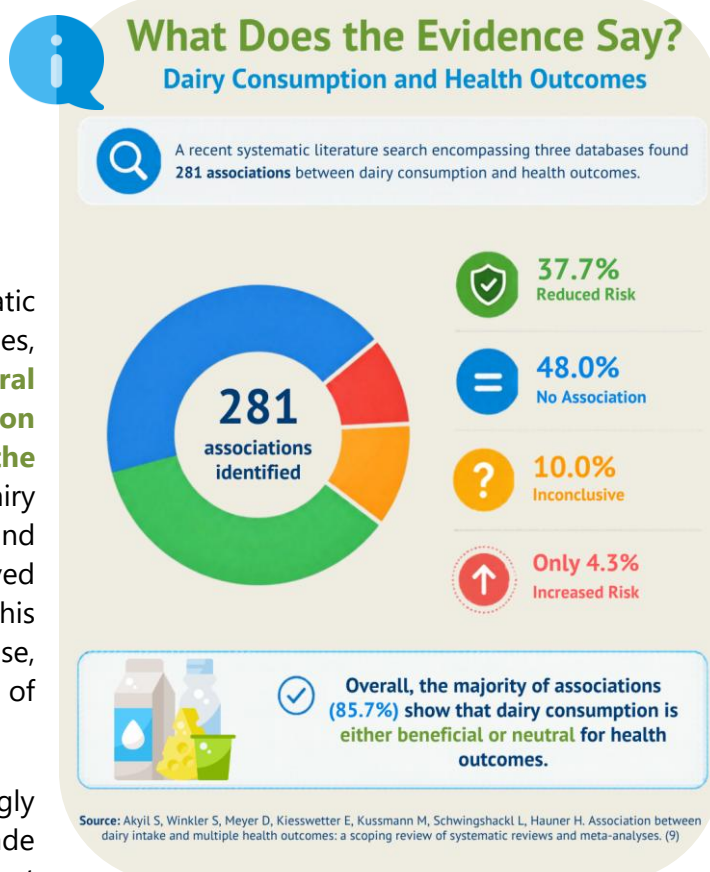
An unhealthy diet is not the only cause of CVD; however, it is one of the major risk factors (next to physical inactivity, tobacco use and high consumption of alcohol), as it can influence blood pressure, cholesterol levels, body weight, and the development of diabetes. General recommendations for reducing behavioural risk factors include limiting salt intake, quit smoking and reducing foods high in saturated fats. Since dairy products can contain significant amounts of saturated fat and/or salt, restricting their consumption may wrongly appear justified.

Scientific literature **repeatedly** shows that **dairy consumption is not associated with increased risk of cardiovascular disease.** (3)

Across multiple meta-analyses, systematic reviews and large-scale prospective studies, **dairy intake is consistently linked to neutral or modestly protective effects on cardiovascular outcomes, depending on the dairy category.** (4, 5, 6, 9). Fermented dairy products specifically such as yogurt, and cheese, show consistent links with improved cardiometabolic health outcomes. (7, 8). This finding is particularly noteworthy for cheese, which can contain relatively high amounts of saturated fat and salt.

Importantly, a growing and increasingly consistent body of evidence in the past decade challenges the traditional assumption that saturated fat intake from dairy increases cardiovascular risk (10, 11, 12). Meta-analyses of observational studies and randomised trials show no clear benefit from reducing saturated fat intake from dairy products in relation to cardiovascular outcomes, reinforcing the **need to evaluate dairy** (and all foods) **within the context of the specific food matrix and overall dietary patterns**, rather than isolated nutrients. (8, 13, 14)

Overall, the evidence suggests **that consuming dairy is not associated with an increased risk of non-communicable diseases or mortality.** In fact, it may moderately reduce the risk of several health outcomes, including adverse cardiovascular outcomes.



2. Key risk factors for CVD

i. LDL cholesterol and blood lipids

LDL (low-density lipoprotein) cholesterol is one of the main lipoproteins that carry cholesterol in the bloodstream. It is often referred to as “bad” cholesterol because elevated levels are associated with an increased risk of CVD, including heart disease and stroke. (15)

Saturated fatty acids are known to increase LDL cholesterol levels, which has historically led to recommendations to overall limit their intake. However, evidence suggests that this relationship is more complex when considering whole foods.

In the case of dairy products, research demonstrates that **total dairy consumption is not associated with increased LDL cholesterol levels.**



Some studies suggest that **low-fat dairy products may even help reduce LDL cholesterol, while full-fat dairy and yogurt may increase HDL cholesterol (the “good” cholesterol)** compared with a control diet. (16)

More broadly, food-based evidence shows that **dairy consumption is not associated with increased cardiovascular risk**, despite its saturated fat content. Effects on blood lipids, including cholesterol profiles, are generally neutral or potentially beneficial, particularly when dairy is consumed within its natural food matrix (like yoghurt, milk and cheese). (17)

Observational evidence also indicates that moderate butter consumption is not necessarily associated with adverse cardiometabolic outcomes. For example, a study by Moore et al. found that more than one teaspoon (5 g) of butter per day was beneficially associated with several CMD risk factors and a lower risk of type 2 diabetes (T2DM). (18)

ii. High blood pressure (hypertension)

Hypertension is a major risk factor for development of stroke, CHD, heart failure, and end-stage renal disease.



Evidence suggests that **dairy consumption may play a role in supporting healthy blood pressure levels**, with some studies (16, 19) reporting a **modest beneficial association between the intake of milk and dairy products and blood pressure.**

For example, a recent meta-analysis (19) comparing different dairy products found that high dairy intake, regardless of fat content, does not negatively affect body weight, blood cholesterol, or blood pressure. In fact, both types of dairy were associated with small improvements in systolic blood pressure: for every extra 200 grams of dairy consumed per day, the risk of developing high blood pressure tended to be lower.

Supporting this, some studies (20, 21) report inverse beneficial associations between total dairy consumption and stroke risk.

Taken together, the evidence suggests that dairy products are part of a balanced diet supporting blood pressure and may contribute to cardiovascular health. As a result, milk and dairy products are included in dietary patterns designed to reduce hypertension risk, such as the DASH diet (Dietary Approach to Stop Hypertension). (22)

iii. Obesity and metabolic health



Dairy consumption is also associated with lower risk of obesity and T2DM, both of which are major cardiovascular risk factors, therefore potentially contributing to CVD prevention. (23, 24)

For example, a recent systematic quantitative meta-analysis (25) reported a linear inverse association, with a 12% lower risk of overweight or obesity per 200 g/d increment in milk consumption, with little heterogeneity between studies.

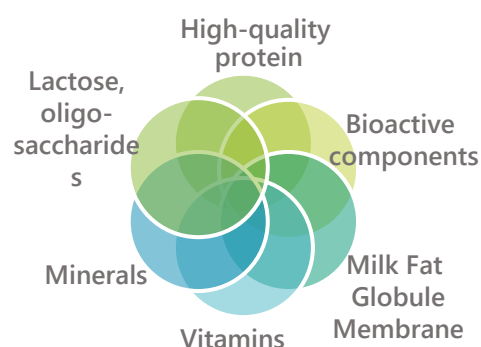
Evidence also suggests an inverse relationship between dairy consumption and body fat: eight meta-analyses (39-46) consistently found that higher yogurt consumption was associated with lower risk of type 2 diabetes compared with lower consumption. Importantly, this favourable association has been observed for both low-fat and full-fat yogurt, with studies reporting no adverse effects of full-fat yogurt on type 2 diabetes risk or related metabolic outcomes. Some studies have even found favourable associations with measures of adiposity, including waist circumference. (19, 26-32)

3. The dairy matrix: the secret to a healthy heart

Taken together, these findings point to a broader question: how can dairy products contribute to cardiovascular health outcomes that are neutral or beneficial, despite their content of nutrients such as saturated fat or sodium?

The answer lies in the **dairy matrix**, which describes the **unique structure of a dairy food, its components** (e.g., nutrients and non-nutrients), and **how they interact**. (33, 34, 35, 36) This means that the health effects of dairy cannot be explained by individual nutrients alone, but by the complex structure of the food and the interactions between its components.

Dairy products contain a combination of fatty acids (among which palmitic acid, butyric acid, oleic acid, linoleic acid), proteins (casein and whey), minerals (calcium, magnesium, phosphate, sodium), and bioactive components such as milk fat globule membrane (MFGM) and peptides. These components and conditions interact during



digestion and absorption, potentially influencing metabolic responses relevant to cardiovascular health.

This matrix concept helps explain why dairy foods may have cardiovascular effects that differ from expectations based solely on their saturated fat content. Although cheese contains more fat than milk or yogurt, this reflects the concentration of the whole milk matrix: the higher fat content is naturally accompanied by proportionally higher amounts of proteins, minerals and MFGM – in a solid format.

Evidence shows that nutrient interactions within the cheese matrix may contribute to neutral or even favourable cardiovascular outcomes, highlighting that the health impact of dairy foods cannot be assessed solely as the sum of their individual nutrients – especially when considering saturated fats. (37, 38)



A study (17) demonstrated that **dairy fat consumed in the form of cheese can have different effects on blood lipids and LDL cholesterol** compared to the same nutrients consumed in other food matrices, with **lower total cholesterol levels observed when consumed within the cheese matrix.**

The fatty acid profile of dairy also contributes to this matrix effect as the specific types of saturated fatty acids present in dairy products being different from the types present in other non-dairy food matrices. In addition, milk fat contains approximately 25-30% monounsaturated fatty acids (mainly oleic acid) and 2-6% polyunsaturated fatty acids, including omega-3 and omega-6 fatty acids. These components contribute to anti-inflammatory and cardiometabolic effects that may support cardiovascular health.

Overall, the dairy matrix provides a scientifically grounded explanation for why whole and fermented dairy foods, such as milk, yogurt, and cheese, are consistently associated with neutral or beneficial cardiovascular outcomes, despite their content of nutrients traditionally considered as risk factors.

4. Conclusion



CVD remains a major public health challenge in Europe, and its prevention requires – in addition to lifestyle interventions, such as quitting smoking and increased physical activity – dietary guidance that reflects the **complexity of foods** and their effects on health.

Current evidence shows that **dairy products have neutral and beneficial associations with CVD** and with key cardiovascular risk factors, including blood lipids, blood pressure, and metabolic health.



These findings demonstrate that **dairy products can play a key role in supporting or promoting heart health**, even when their nutrient composition might suggest otherwise, and most importantly, they highlight the importance of **moving beyond a focus on individual nutrients** such as saturated fat **and instead considering the whole food structure**, i.e. the actual health impact of foods consumed.





Sources and further reading:

- (1) National Heart, Lung, and Blood Institute. Know the Difference: Cardiovascular Disease, Heart Disease, Coronary Heart Disease Factsheet. 2021. Available at: <https://www.nhlbi.nih.gov/resources/know-differences-cardiovascular-disease-heart-disease-coronary-heart-disease>
- (2) European Society of Cardiology EU27 Cardiovascular Realities 2025. Available at: <https://www.flipsnack.com/escardio/eu-27-cardiovascular-realities-2025/full-view.html>
- (3) Soedamah-Muthu SS. & de Goede J., Dairy Consumption and Cardiometabolic Diseases: Systematic Review and Updated Meta-Analyses of Prospective Cohort Studies, J. Curr Nutr Rep (2018) 7: 171. [2018] DOI : <https://doi.org/10.1007/s13668-018-0253-y>
- (4) Crichton GE, Bogucki OE, Elias MF. Dairy food intake, diet patterns, and health: Findings from the Maine-Syracuse Longitudinal Study. Int Dairy J. 2019 Apr;91:64-70. Available from: <https://pubmed.ncbi.nlm.nih.gov/31787807/>
- (5) Drouin-Chartier JP et al., Systematic Review of the Association between Dairy Product Consumption and Risk of cardiovascular-Related Clinical Outcomes. Adv Nutr. 2016 Nov 15;7(6):1026-1040. [2016] doi: 10.3945/an.115.011403.
- (6) Mozaffarian D. Dietary and Policy Priorities for Cardiovascular Disease, Diabetes, and Obesity: A Comprehensive Review. Circulation [Internet]. 2016 Jan 12;133(2):187–225. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26746178>
- (7) Wolever TM. Yogurt Is a Low-Glycemic Index Food. J Nutr [Internet]. 2017 Jul;147(7):1462S–1467S. Available from: <http://jn.nutrition.org/lookup/doi/10.3945/jn.116.240770>
- (8) Matalas A, Panagiotakos D, Fardet A, Savary-Auzeloux I, Chassard C, Praćer S, Vergères G and Paveljšek D (2026) Fermented foods consumption, all-cause, and cause-specific mortality: a meta-analysis of prospective cohort studies. Front. Nutr. 13:1714437. doi: 10.3389/fnut.2026.1714437
- (9) Akyil S, Winkler S, Meyer D, Kiesswetter E, Kussmann M, Schwingshackl L, Hauner H. Association between dairy intake and multiple health outcomes: a scoping review of systematic reviews and meta-analyses. Eur J Clin Nutr. 2026 Jan;80(1):16-27. doi: 10.1038/s41430-025-01639-5. Epub 2025 Jul 26. PMID: 40715472; PMCID: PMC12783052.
- (10) Givens D. I., Saturated Fats, dairy foods and health: A curious paradox?, Nutr Bull, 42: 274-282. doi:10.1111/nbu.12283 [2017] DOI: <https://doi.org/10.1111/nbu.12283>
- (11) Astrup A, Magkos F, Bier DM, Brenna JT, de Oliveira Otto MC, Hill JO, King JC, Mente A, Ordovas JM, Volek JS, Yusuf S, Krauss RM. Saturated Fats and Health: A Reassessment and Proposal for Food-Based Recommendations: JACC State-of-the-Art Review. J Am Coll Cardiol. 2020 Aug 18;76(7):844-857. doi: 10.1016/j.jacc.2020.05.077. Epub 2020 Jun 17. PMID: 32562735.
- (12) Lamarche B, Astrup A, Eckel RH, Feeney E, Givens I, Krauss RM, Legrand P, Micha R, Michalski MC, Soedamah-Muthu S, Sun Q, Kok FJ. Regular-fat and low-fat dairy foods and cardiovascular diseases: perspectives for future dietary recommendations. Am J Clin Nutr. 2025 May;121(5):956-964. doi: 10.1016/j.ajcnut.2025.03.009. Epub 2025 Mar 13. PMID: 40088974; PMCID: PMC12107492.
- (13) Mozaffarian D. Identifying nutritional priorities for global health: time for a more PURE focus on protective foods. Eur Heart J. 2023 Jul 21;44(28):2580-2582. doi: 10.1093/eurheartj/ehad325. PMID: 37414412; PMCID: PMC10361008.
- (14) Zhangling Chen, Mavra Ahmed, Vanessa Ha, Katherine Jefferson, Vasanti Malik, Paula A B Ribeiro, Priscilla Zuchinali, Jean-Philippe Drouin-Chartier, Dairy Product Consumption and Cardiovascular Health: A Systematic Review and Meta-analysis of Prospective Cohort Studies, Advances in Nutrition, Volume 13, Issue 2, 2022, Pages 439-454, ISSN 2161-8313, <https://doi.org/10.1093/advances/nmab118>.
- (15) U.S. Centers for Disease Control and Prevention, LDL and HDL Cholesterol and Triglycerides. Available at: <https://www.cdc.gov/cholesterol/about/ldl-and-hdl-cholesterol-and-triglycerides.html>
- (16) Benatar JR, Sidhu K, Stewart RA. Effects of high and low fat dairy food on cardio-metabolic risk factors: a meta-analysis of randomized studies. PLoS One. 2013 Oct 11;8(10):e76480. doi: 10.1371/journal.pone.0076480. PMID: 24146877; PMCID: PMC3795726.
- (17) Feeney EL, Barron R, Dible V, Hamilton Z, Power Y, Tanner L, Flynn C, Bouchier P, Beresford T, Noronha N, Gibney ER. Dairy matrix effects: response to consumption of dairy fat differs when eaten within the cheese matrix—a randomized controlled trial. Am J Clin Nutr. 2018 Oct 1;108(4):667-674. doi: 10.1093/ajcn/nqy146. Erratum in: Am J Clin Nutr. 2018 Dec 1;108(6):1356. doi: 10.1093/ajcn/nqy316. PMID: 30107488.

- (18) Zhou X, Yiannakou I, Yuan M, Singer MR, Moore LL. Associations of common fats and oils with cardiometabolic health outcomes in the Framingham Offspring cohort. *Eur J Clin Nutr*. 2025 Sep;79(9):904-911. doi: 10.1038/s41430-025-01601-5. Epub 2025 May 22. PMID: 40404978.
- (19) Eva Kiesswetter, Julia Stadelmaier, Maria Petropoulou, Jakub Morze, Kathrin Grummich, Isabelle Roux, Roberta Lay, Lisa Himmelsbach, Martin Kussmann, Christine Roeger, Malte Rubach, Hans Hauner, Lukas Schwingshackl, Effects of Dairy Intake on Markers of Cardiometabolic Health in Adults: A Systematic Review with Network Meta-Analysis, *Advances in Nutrition*, Volume 14, Issue 3, 2023, Pages 438-450, ISSN 2161-8313, <https://doi.org/10.1016/j.advnut.2023.03.004>.
- (20) Dehghan M, Mente A, Zhang X, Swaminathan S, Li W, Mohan V, Iqbal R, Kumar R, Wentzel-Viljoen E, Rosengren A, Amma LI, Avezum A, Chifamba J, Diaz R, Khatib R, Lear S, Lopez-Jaramillo P, Liu X, Gupta R, Mohammadifard N, Gao N, Oguz A, Ramli AS, Seron P, Sun Y, Szuba A, Tsolekile L, Wielgosz A, Yusuf R, Hussein Yusufali A, Teo KK, Rangarajan S, Dagenais G, Bangdiwala SI, Islam S, Anand SS, Yusuf S; Prospective Urban Rural Epidemiology (PURE) study investigators. Associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries from five continents (PURE): a prospective cohort study. *Lancet*. 2017 Nov 4;390(10107):2050-2062. doi: 10.1016/S0140-6736(17)32252-3. Epub 2017 Aug 29. PMID: 28864332.
- (21) Maryam S. Farvid, Akbar F. Malekshah, Akram Pourshams, Hossein Poustchi, Sadaf G. Sepanlou, Maryam Sharafkhan, Masoud Khoshnia, Mojtaba Farvid, Christian C. Abnet, Farin Kamangar, Sanford M. Dawsey, Paul Brennan, Paul D. Pharoah, Paolo Boffetta, Walter C. Willett, Reza Malekzadeh, Dairy Food Intake and All-Cause, Cardiovascular Disease, and Cancer Mortality: The Golestan Cohort Study, *American Journal of Epidemiology*, Volume 185, Issue 8, 15 April 2017, Pages 697–711, <https://doi.org/10.1093/aje/kww139>
- (22) British Heart Foundation: DASH diet: what to eat for high blood pressure. August 2025. Available at: <https://www.bhf.org.uk/information-support/heart-matters-magazine/nutrition/foods-that-lower-blood-pressure/dash-diet>
- (23) Aune D, Norat T, Romundstad P, Vatten LJ. Dairy products and the risk of type 2 diabetes: a systematic review and dose-response meta-analysis of cohort studies. *Am J Clin Nutr* 2013; 98: 1066–1083 [2013] <https://doi.org/10.3945/ajcn.113.059030>
- (24) Gijssbers L, Ding EL, Malik VS, de Goede J, Geleijnse JM, Soedamah-Muthu SS. Consumption of dairy foods and diabetes incidence: a dose-response meta-analysis of observational studies. *Am J Clin Nutr* 2016;103:1111–24. [2016] DOI: <https://doi.org/10.3945/ajcn.115.123216>
- (25) Feng Y, Zhao Y, Liu J, Huang Z, Yang X, Qin P, Chen C, Luo X, Li Y, Wu Y, Li X, Huang H, Hu F, Hu D, Liu Y, Zhang M. Consumption of Dairy Products and the Risk of Overweight or Obesity, Hypertension, and Type 2 Diabetes Mellitus: A Dose-Response Meta-Analysis and Systematic Review of Cohort Studies. *Adv Nutr*. 2022 Dec 22;13(6):2165-2179. doi: 10.1093/advances/nmac096. PMID: 36047956; PMCID: PMC9776648.
- (26) Diaz-Lopez, A., Bullo, M., Martinez-Gonzalez, M. A., Corella, D., Estruch, R., Fito, M., . . . Salas-Salvado, J. (2016). Dairy product consumption and risk of type 2 diabetes in an elderly Spanish Mediterranean population at high cardiovascular risk. *Eur J Nutr*, 55(1), 349-360.
- (27) Babio, N., Becerra-Tomas, N., Martinez-Gonzalez, M. A., Corella, D., Estruch, R., Ros, E., . . . Investigators, P. (2015). Consumption of Yogurt, Low-Fat Milk, and Other Low-Fat Dairy Products Is Associated with Lower Risk of Metabolic Syndrome Incidence in an Elderly Mediterranean Population. *J Nutr*, 145(10), 2308-2316.
- (28) Yuzbashian, E., Asghari, G., Mirmiran, P., Chan, C. B., & Azizi, F. (2021). Changes in dairy product consumption and subsequent type 2 diabetes among individuals with prediabetes: Tehran Lipid and Glucose Study. *Nutr J*, 20(1), 88.
- (29) Trichia E., Luben, R., Khaw, K-T, Wareham, N.J., Imamura, F., Forouhi, N.G. (2020) The associations of longitudinal changes in consumption of total and types of dairy products and markers of metabolic risk and adiposity: findings from the European Investigation into Cancer and Nutrition (EPIC)-Norfolk study, United Kingdom. *AJCN* 111:1018-1026.
- (30) Slurink, I. A. L., den Braver, N. R., Rutters, F., Kupper, N., Smeets, T., Elders, P. J. M., . . . Soedamah-Muthu, S. S. (2022a). Dairy product consumption and incident prediabetes in Dutch middle-aged adults: the Hoorn Studies prospective cohort. *Eur J Nutr*, 61(1), 183-196.
- (31) Slurink, I. A. L., Voortman, T., Ochoa-Rosales, C., Ahmadizar, F., Kavousi, M., Kupper, N., . . . Soedamah-Muthu, S. S. (2022b). Dairy Product Consumption in Relation to Incident Prediabetes and Longitudinal Insulin Resistance in the Rotterdam Study. *Nutrients*, 14(3).
- (32) Sayon-Orea, C., Bes-Rastrollo, M., Marti, A., Pimenta, A. M., Martin-Calvo, N., & Martinez-Gonzalez, M. A. (2015). Association between yogurt consumption and the risk of metabolic syndrome over 6 years in the SUN study. *BMC Public Health*, 15, 170.

- (33) Weaver, Connie M. "Dairy matrix: is the whole greater than the sum of the parts?." *Nutrition reviews* vol. 79, Suppl 2 (2021): 4-15. doi:10.1093/nutrit/nuab081
- (34) Mulet-Cabero AI, Torres-Gonzalez M, Geurts J, Rosales A, Farhang B, Marmonier C, Ulleberg EK, Hocking E, Neiderer I, Gandolfi I, Anderson L, Brader L, Vermaak M, Cameron M, Myrup Christensen M, Haryono R, Peters S. The Dairy Matrix: Its Importance, Definition, and Current Application in the Context of Nutrition and Health. *Nutrients*. 2024 Aug 31;16(17):2908. doi: 10.3390/nu16172908. PMID: 39275224; PMCID: PMC11397276.
- (35) Feeney, E.L., Lamichhane, P. and Sheehan, J.J. (2021), The cheese matrix: Understanding the impact of cheese structure on aspects of cardiovascular health – A food science and a human nutrition perspective. *Int J Dairy Technol*, 74: 656-670. <https://doi.org/10.1111/1471-0307.12755>
- (36) Tremblay, A., Drouin-Chartier, J. P., Marette, A., & Drapeau, V. (2026). Yogurt and health: a focus on its matrix. *Critical Reviews in Food Science and Nutrition*, 66(2), 342–351. <https://doi.org/10.1080/10408398.2025.2524472>
- (37) Weaver, C. M., & Givens, D. I. (2025). Overview: the food matrix and its role in the diet. *Critical Reviews in Food Science and Nutrition*, 65(30), 6880–6897. <https://doi.org/10.1080/10408398.2025.2453074>
- (38) O'Sullivan, T. A., & Nicholl, A. (2026). Exploring the dairy milk matrix beyond isolated nutrients—a narrative review: For resubmission to "The Important Role of the Dairy Matrix in Diet and Health" issue in *Critical Reviews in Food Science and Nutrition*. *Critical Reviews in Food Science and Nutrition*, 1–21. <https://doi.org/10.1080/10408398.2026.2648097>
- (39) Tong, X. et al. (2011) "Dairy consumption and risk of type 2 diabetes mellitus: a meta-analysis of cohort studies," *European Journal of Clinical Nutrition*, 65(9), pp. 1027–1031. Available at: <https://doi.org/10.1038/ejcn.2011.62>
- (40) Gao, D. et al. (2013) "Dairy products consumption and risk of type 2 diabetes: systematic review and dose-response meta-analysis," *PloS One*, 8(9), p. e73965. Available at: <https://doi.org/10.1371/journal.pone.0073965>
- (41) Aune, D. et al. (2013) "Dairy products and the risk of type 2 diabetes: a systematic review and dose-response meta-analysis of cohort studies," *The American Journal of Clinical Nutrition*, 98(4), pp. 1066–1083. Available at: <https://doi.org/10.3945/ajcn.113.059030>
- (42) Chen, M. et al. (2014) "Dairy consumption and risk of type 2 diabetes: 3 cohorts of US adults and an updated meta-analysis," *BMC medicine*, 12, p. 215. Available at: <https://doi.org/10.1186/s12916-014-0215-1>
- (43) Gijssbers, L. et al. (2016) "Consumption of dairy foods and diabetes incidence: a dose-response meta-analysis of observational studies," *The American Journal of Clinical Nutrition*, 103(4), pp. 1111–1124. Available at: <https://doi.org/10.3945/ajcn.115.123216>
- (44) Companys, J. et al. (2020) "Fermented Dairy Products, Probiotic Supplementation, and Cardiometabolic Diseases: A Systematic Review and Meta-analysis," *Advances in Nutrition*, 11(4), pp. 834–863. Available at: <https://doi.org/10.1093/advances/nmaa030>
- (45) Zhang, K., Bai, P. and Deng, Z. (2022) "Dose-Dependent Effect of Intake of Fermented Dairy Foods on the Risk of Diabetes: Results From a Meta-analysis," *Canadian Journal of Diabetes*, 46(3), pp. 307–312. Available at: <https://doi.org/10.1016/j.cjcd.2021.09.003>
- (46) Mohan, V. et al. (2023) "Effect of Milk and Cultured Milk Products on Type 2 Diabetes: A Global Systematic Review and Meta-analysis of Prospective Cohort Studies," *Journal of the Indian Institute of Science*, 103(1), pp. 167–190. Available at: <https://doi.org/10.1007/s41745-023-00396-3>