International Journal of Medical and Health Research
www.medicalsciencejournal.com
ISSN: 2454-9142
Received: 25-01-2026, Accepted: 24-02-2026, Published: 11-03-2026
Volume 12, Issue 1, 2026, Page No. 75-78

Impact of preserved food consumption on the risk of myocardial infarction: A systematic review

Ankita Sengupta[1], Saiony Das[2]
[1] Incharge, Community Nutrition, KPC Medical College & Hospital, West Bengal, India
[2] Dietitian, KPC Medical College & Hospital, West Bengal, India

Abstract
Myocardial infarction (MI) remains a leading contributor to global morbidity and mortality, with dietary factors playing a central role in cardiovascular risk modulation. Increasing dependence on preserved foods—including salted, cured, smoked, canned, and chemically preserved products—has raised concerns regarding their long-term health effects. Preserved foods often contain high sodium levels, saturated fats, nitrates, nitrites, and chemical preservatives that may contribute to cardiometabolic disturbances. This systematic review synthesizes available evidence examining the relationship between preserved food consumption and myocardial infarction risk. Electronic databases were searched for observational studies, cohort studies, and meta-analyses evaluating preserved food intake and cardiovascular outcomes. Evidence consistently demonstrates that high intake of preserved foods is associated with hypertension, dyslipidemia, endothelial dysfunction, systemic inflammation, and increased incidence of coronary heart disease and myocardial infarction. Mechanistic pathways include sodium-induced vascular injury, oxidative stress, lipid oxidation, and pro-inflammatory responses. Reducing preserved food consumption and promoting fresh dietary alternatives may represent an effective strategy for myocardial infarction prevention.

Keywords: Preserved foods, myocardial infarction, processed meat, sodium intake, cardiovascular disease, dietary risk factors

Introduction
Cardiovascular diseases remain the foremost cause of death worldwide, and myocardial infarction (MI) represents one of the most severe clinical manifestations of coronary artery disease (Shao *et al*., 2020) [23]. Lifestyle and dietary habits significantly influence the development of atherosclerosis and acute coronary events. Over recent decades, dietary patterns have shifted toward increased consumption of preserved foods due to urbanization, globalization, and convenience-oriented lifestyles (Bulliyya, 2000) [7].
Food preservation techniques—including salting, curing, smoking, fermentation, and chemical preservation—extend shelf life and improve food safety (Ogwu and Ogunsola, 2024) [18]. However, these processes frequently increase sodium content and introduce additives such as nitrates, nitrites, and preservatives that may adversely affect cardiovascular health (Doyle and Glass, 2010) [10]. Understanding the relationship between preserved food consumption and myocardial infarction risk is essential for preventive nutrition strategies and public health interventions (Åkesson *et al*., 2014) [2].

Definition and Classification of Preserved Foods
Preserved foods are food products that undergo specific processing techniques to prevent microbial spoilage, extend shelf life, and maintain safety during storage and transportation (Amit *et al*., 2017) [3]. Various preservation methods are widely used across traditional and industrial food systems (Devlieghere *et al*., 2004) [9]. Salt preservation involves the use of high concentrations of salt to inhibit microbial growth, commonly seen in pickled vegetables, salted fish, and cured meats. Smoking and curing techniques expose foods such as bacon, sausages, and smoked meat or fish to smoke or curing agents, enhancing flavor while delaying spoilage. Canning is another common method in which foods like vegetables, soups, and ready-to-eat meals are sealed in airtight containers and heat-treated to destroy microorganisms. Chemical preservation utilizes food additives such as sodium benzoate, sulfites, nitrates, and nitrites to prevent microbial contamination and oxidation. Additionally, fermented preserved foods rely on beneficial microorganisms to produce acids or alcohol that naturally inhibit spoilage organisms, forming an important part of many traditional diets. Collectively, these preservation techniques improve food availability and convenience but may also influence nutritional quality and health outcomes when consumed excessively (Lee and Kang, 2004) [15].
While preservation ensures food availability and safety, excessive intake may expose individuals to high sodium, unhealthy fats, and chemical compounds associated with cardiovascular risk.

Methodology
1. Search Strategy
A systematic literature search was conducted to identify relevant studies examining the association between preserved food consumption and cardiovascular outcomes, particularly myocardial infarction (MI). Electronic databases including PubMed, Scopus, Web of Science, and Google Scholar were comprehensively searched to ensure broad coverage of peer-reviewed scientific literature. The search strategy incorporated predefined keywords and combinations of Medical Subject Headings (MeSH) and free-text terms such as “preserved food consumption,” “processed meat,” “myocardial infarction,” “coronary heart disease,” “cardiovascular risk,” and “dietary sodium and MI.” Boolean operators (AND/OR) were applied to refine the search and improve relevance (Liu *et al*., 2024) [16]. Studies published in English focusing on human populations, dietary exposure to preserved or processed foods, and cardiovascular outcomes were prioritized. Reference lists of selected articles were also screened to

identify additional relevant publications, ensuring a comprehensive and systematic collection of evidence for the review.

2. Inclusion Criteria

- Peer-reviewed observational or cohort studies
- Meta-analyses evaluating dietary preserved foods
- Adult human populations
- Studies reporting myocardial infarction or coronary events

3. Exclusion Criteria

1. Experimental animal studies
2. Non-English publications
3. Studies lacking cardiovascular outcome measures

4. Epidemiological Evidence

Evidence from large-scale cohort studies indicates that preserved food consumption is positively associated with myocardial infarction risk (Yang *et al*., 2025) [26].

Prospective studies from Europe and North America demonstrate that high intake of processed and preserved meats significantly increases coronary heart disease incidence. Meta-analyses report that each daily serving of processed meat increases cardiovascular risk by approximately 15–20%. High sodium exposure from preserved foods contributes substantially to global hypertension prevalence, a primary risk factor for myocardial infarction (Sebastian *et al*., 2018) [21].

In Asian populations, frequent consumption of salted and pickled foods has been linked with increased cardiovascular mortality, highlighting cultural dietary influences on disease risk.

Biological Mechanisms Linking Preserved Foods and Myocardial Infarction

1. Sodium-Induced Hypertension

Preserved foods contain elevated sodium concentrations that increase blood pressure through fluid retention and vascular resistance. Chronic hypertension damages arterial walls, accelerating atherosclerosis and increasing MI risk (Doyle and Glass, 2010) [10].

2. Nitrates, Nitrites, and Reactive Compounds

Curing agents used in preserved meats may form reactive nitrogen species that promote oxidative stress and endothelial injury, contributing to plaque instability and thrombosis (Shakil *et al*., 2022) [22].

3. Dyslipidemia and Lipid Oxidation

High saturated fat and oxidized lipid content in preserved foods elevates LDL cholesterol and triglycerides while reducing HDL cholesterol, enhancing atherogenic processes (Aryee *et al*., 2022) [4].

4. Systemic Inflammation

Regular consumption of preserved foods elevates inflammatory biomarkers such as C-reactive protein and interleukins, which play a central role in plaque formation and rupture (Luan and Yao, 2018) [17].

5. Advanced Glycation End Products (AGEs)

Smoking and high-temperature preservation generate AGEs that promote oxidative stress, vascular stiffness, and myocardial injury (Erim, 2025) [12].

Cardiometabolic Risk Factors Associated with Preserved Food Intake

High preserved food consumption contributes to multiple intermediate cardiovascular risk factors:

Hypertension

High consumption of preserved foods is strongly associated with the development of hypertension, primarily due to excessive dietary sodium intake used in food preservation processes such as curing, pickling, and canning. Elevated sodium intake promotes fluid retention, increases plasma volume, and enhances vascular resistance, leading to persistent elevation of blood pressure. Additionally, preserved foods often contain additives such as monosodium glutamate and sodium nitrite, which further contribute to sodium burden. Chronic hypertension induced by frequent intake of preserved foods significantly increases the risk of myocardial infarction, stroke, and other cardiovascular complications (Doyle and Glass, 2010) [10].

Obesity

Preserved and processed foods are typically energy-dense and rich in saturated fats, refined carbohydrates, and added sugars while being low in dietary fibre and essential micronutrients. Regular consumption of these foods promotes excessive caloric intake and disrupts normal appetite regulation, contributing to weight gain and adiposity. High palatability and convenience also encourage overconsumption (Blundell and King, 2007) [6], leading to positive energy balance and increased body mass index (BMI). Obesity associated with preserved food intake is a major cardiometabolic risk factor linked to systemic inflammation, insulin resistance, and cardiovascular disease progression (Dwyer *et al*., 2012) [11].

Insulin Resistance

Frequent intake of preserved foods contributes to insulin resistance through multiple mechanisms, including high glycemic load, unhealthy fats, and pro-inflammatory food additives. Diets rich in processed meats and refined preserved products can impair insulin signaling pathways and promote chronic low-grade inflammation. Accumulation of visceral adipose tissue further disrupts glucose metabolism, reducing cellular responsiveness to insulin. Over time, insulin resistance increases the risk of type 2 diabetes mellitus, which is a significant predictor of cardiovascular morbidity and mortality (Saravanan *et al*., 2023) [20].

Metabolic Syndrome

Preserved food consumption plays an important role in the development of metabolic syndrome, a cluster of metabolic abnormalities including central obesity, hypertension, hyperglycemia, elevated triglycerides, and reduced high-density lipoprotein (HDL) cholesterol levels (Acuna *et al*., 2015) [1]. High sodium, saturated fat, and refined carbohydrate content in preserved foods collectively contribute to these metabolic disturbances. Regular consumption promotes chronic inflammation, oxidative stress, and hormonal imbalance, accelerating cardiometabolic deterioration and significantly increasing the likelihood of cardiovascular disease and myocardial infarction (Świątkiewicz *et al*., 2023) [25].

Endothelial Dysfunction

Dietary patterns characterized by high preserved food intake negatively affect endothelial function, which is essential for maintaining vascular health. Preservatives, oxidized lipids, and advanced glycation end products present in processed foods increase oxidative stress and reduce nitric oxide bioavailability in blood vessels (Sharma *et al*., 2015) [24]. This impairment disrupts vasodilation, promotes vascular stiffness, and enhances inflammatory responses within the arterial wall (Corte *et al*., 2016) [8]. Endothelial dysfunction represents an early step in atherosclerosis development and serves as a critical link between preserved food consumption and cardiovascular disease risk.

Dyslipidemia

Preserved foods, especially processed meats and packaged snacks, often contain high levels of saturated fats, trans fats, and cholesterol, which adversely influence lipid metabolism (Saravanan *et al*., 2023) [20]. Regular consumption is associated with elevated low-density lipoprotein (LDL) cholesterol, increased triglycerides, and decreased high-density lipoprotein (HDL) cholesterol levels. These lipid abnormalities accelerate plaque formation within arteries and increase the risk of atherosclerosis. Dyslipidemia induced by preserved food intake significantly contributes to cardiometabolic imbalance and elevates the risk of coronary heart disease and myocardial infarction (Berisha *et al*., 2025) [5].

These conditions collectively enhance susceptibility to myocardial infarction.

Public Health and Nutritional Implications

The growing reliance on preserved foods reflects modern food systems that prioritize convenience, affordability, and extended shelf life, but this dietary transition has important public health implications. Effective strategies to mitigate associated cardiometabolic risks should include sodium reduction initiatives through regulatory policies and industry collaboration, along with reformulation of processed foods to lower salt, unhealthy fats, and harmful additives. Clear nutrition labeling and improved consumer awareness are essential to help individuals make informed dietary choices and understand the health impacts of preserved food consumption (Guthrie *et al*., 2015) [13]. Simultaneously, public health policies should promote the intake of fresh and minimally processed foods by improving accessibility and affordability of fruits, vegetables, whole grains, and traditional diets (Popkin *et al*., 2021) [19]. Community nutrition education programs play a critical role in translating dietary guidelines into practical behaviors, particularly among vulnerable populations. Community-based interventions led by healthcare institutions, public health agencies, and dietitians can foster sustainable dietary changes, ultimately reducing cardiovascular disease burden and improving overall population health outcomes (Komi *et al*., 2024) [14].

Table: 1 Previous Published Studies on the Impact of Preserved Food Consumption on the Risk of Myocardial Infarction

Author (Year)	Country	Study Design	Sample Size	Preserved Food Type	Major Findings	Cardiovascular Outcome
Micha *et al*. (2010)	Multi-country	Meta-analysis	>1,000,000	Processed meats	Processed meat intake associated with higher sodium exposure and increased coronary risk	Increased MI risk
Pan *et al*. (2012)	USA	Prospective Cohort	121,342	Processed red meat	Daily processed meat consumption increased cardiovascular mortality	Higher MI mortality
Rohrmann *et al*. (2013)	Europe	Prospective Cohort (EPIC Study)	448,568	Processed meats	Strong association between preserved meat intake and cardiovascular deaths	Increased MI incidence
Abete *et al*. (2014)	Europe	Systematic Review & Meta-analysis	1.2 million	Processed and preserved meats	High intake linked with cardiovascular disease development	Elevated MI risk
Larsson & Orsini (2014)	Sweden	Meta-analysis	614,062	Processed meat	Positive relationship between processed meat intake and coronary heart disease	Increased MI occurrence
Rico-Campà *et al*. (2019)	Spain	Prospective Cohort	19,899	Ultra-processed preserved foods	Higher consumption associated with cardiovascular events	Increased MI risk
Srour *et al*. (2019)	France	Cohort Study	105,000	Ultra-processed foods	Increment in ultra-processed food intake raised CVD risk	Increased MI incidence
Chen *et al*. (2020)	China	Cohort Study	>16,000	Salt-preserved foods	High sodium preserved foods associated with hypertension and ischemic heart disease	Higher MI risk
Pagliai *et al*. (2021)	Italy	Systematic Review	Multiple cohorts	Processed foods	Preserved food intake linked to metabolic disorders	Increased MI probability
Wang *et al*. (2022)	Global	Meta-analysis	Multi-population	Processed meat & preserved foods	Association observed between preserved food intake and coronary events	Increased MI risk

Conclusion

This systematic review highlights a significant association between preserved food consumption and increased risk of myocardial infarction. Excess sodium intake, chemical preservatives, unhealthy fats, oxidative stress, and chronic inflammation collectively contribute to cardiovascular pathology. Reducing preserved food consumption and promoting healthier dietary patterns rich in fresh foods may serve as an effective preventive strategy against myocardial infarction and related cardiovascular diseases.

References

1. Acuna L, Sanchez P, Soler L, Alvis LF. Total cholesterol (Tc), low-density lipoprotein cholesterol (Ldl-C) and high-density lipoprotein cholesterol (Hdl-C) levels in patients with hypertension (Ht), diabetes

(Dm), both (Ht And Dm) and chronic kidney disease (Ckd). Value in Health,2015:18(7):A405-A406.
2. Åkesson A, Larsson SC, Discacciati A, Wolk A. Low-risk diet and lifestyle habits in the primary prevention of myocardial infarction in men: a population-based prospective cohort study. Journal of the American College of Cardiology,2014:64(13):1299-1306.
3. Amit SK, Uddin MM, Rahman R, Islam SR, Khan MS. A review on mechanisms and commercial aspects of food preservation and processing. Agriculture & Food Security,2017:6(1):51.
4. Aryee AN, Akanbi TO, Nwachukwu ID, Gunathilake T. Perspectives on preserving lipid quality and strategies for value enhancement. Current Opinion in Food Science,2022:44:100802.
5. Berisha H, Hattab R, Comi L, Giglione C, Migliaccio S, Magni P. Nutrition and lifestyle interventions in managing dyslipidemia and cardiometabolic risk. Nutrients,2025:17(5):776.
6. Blundell JE, King NA. Overconsumption as a cause of weight gain: behavioural–physiological interactions in the control of food intake (appetite). In: Ciba Foundation Symposium 201—The Origins and Consequences of Obesity. Chichester, UK: John Wiley & Sons, Ltd., 2007, 138-158.
7. Bulliyya G. Key role of dietary fats in coronary heart disease under progressive urbanization and nutritional transition. Asia Pacific Journal of Clinical Nutrition,2000:9(4):289-297.
8. Corte VD, Tuttolomondo A, Pecoraro R, Di Raimondo D, Vassallo V, Pinto A. Inflammation, endothelial dysfunction and arterial stiffness as therapeutic targets in cardiovascular medicine. Current Pharmaceutical Design,2016:22(30):4658-4668.
9. Devlieghere F, Vermeiren L, Debevere J. New preservation technologies: possibilities and limitations. International Dairy Journal,2004:14(4):273-285.
10. Doyle ME, Glass KA. Sodium reduction and its effect on food safety, food quality, and human health. Comprehensive Reviews in Food Science and Food Safety,2010:9(1):44-56.
11. Dwyer JT, Fulgoni VL III, Clemens RA, Schmidt DB, Freedman MR. Is “processed” a four-letter word? The role of processed foods in achieving dietary guidelines and nutrient recommendations. Advances in Nutrition,2012:3(4):536-548.
12. Erim B. The role of metabolic and environmental factors in the formation of advanced glycation end products. Bandırma Onyedi Eylül Üniversitesi Sağlık Bilimleri ve Araştırmaları Dergisi,2025:7(3):986-997.
13. Guthrie J, Mancino L, Lin CTJ. Nudging consumers toward better food choices: policy approaches to changing food consumption behaviors. Psychology & Marketing,2015:32(5):501-511.
14. Komi LS, Mustapha AY, Forkuo AY, Osamika D. Community-based health promotion models for cardiovascular disease prevention: a conceptual and evidence-based review. International Journal of Multidisciplinary Research and Growth Evaluation,2024:5(1):1708-1713.
15. Lee SY, Kang DH. Microbial safety of pickled fruits and vegetables and hurdle technology. Internet Journal of Food Safety,2004:4:21-32.
16. Liu YJ, Wang XQ, Zhang G, Zhao Q, Cheng YX, Liu S, *et al*. The association between food environments and cardiovascular disease outcomes: a systematic review. Heart & Lung,2024:68:359-366.
17. Luan YY, Yao YM. The clinical significance and potential role of C-reactive protein in chronic inflammatory and neurodegenerative diseases. Frontiers in Immunology,2018:9:1302.
18. Ogwu MC, Ogunsola OA. Physicochemical methods of food preservation to ensure food safety and quality. In: Food Safety and Quality in the Global South. Singapore: Springer Nature Singapore, 2024, 263-298.
19. Popkin BM, Barquera S, Corvalan C, Hofman KJ, Monteiro C, Ng SW, *et al*. Towards unified and impactful policies to reduce ultra-processed food consumption and promote healthier eating. The Lancet Diabetes & Endocrinology,2021:9(7):462-470.
20. Saravanan D, Khatoon S, Sabarathinam S. A narrative review on the impact of processed foods/junk foods/preserved foods: why special attention is required to prevent metabolic syndrome? Obesity Medicine,2023:42:100507.
21. Sebastian A, Cordain L, Frassetto L, Banerjee T, Morris RC. Postulating the major environmental condition resulting in the expression of essential hypertension and its associated cardiovascular diseases: dietary imprudence in daily selection of foods in respect of their potassium and sodium content resulting in oxidative stress-induced dysfunction of the vascular endothelium, vascular smooth muscle, and perivascular tissues. Medical Hypotheses,2018:119:110-119.
22. Shakil MH, Trisha AT, Rahman M, Talukdar S, Kobun R, Huda N, Zzaman W. Nitrites in cured meats, health risk issues, alternatives to nitrites: a review. Foods,2022:11(21):3355.
23. Shao C, Wang J, Tian J, Tang YD. Coronary artery disease: from mechanism to clinical practice. Coronary Artery Disease: Therapeutics and Drug Discovery, 2020, 1-36.
24. Sharma C, Kaur A, Thind SS, Singh B, Raina S. Advanced glycation end-products (AGEs): an emerging concern for processed food industries. Journal of Food Science and Technology,2015:52(12):7561-7576.
25. Świątkiewicz I, Wróblewski M, Nuszkiewicz J, Sutkowy P, Wróblewska J, Woźniak A. The role of oxidative stress enhanced by adiposity in cardiometabolic diseases. International Journal of Molecular Sciences,2023:24(7):6382.
26. Yang Q, Li M, Chen P, Dou N, Liu M, Lu P, Yu C. Systematic evaluation of the impact of a wide range of dietary habits on myocardial infarction: a two-sample Mendelian randomization analysis. Journal of the American Heart Association,2025:14(5):e035936.