ARTICLE

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PLANT-BASED PRODUCTS IN THERAPEUTIC AND PREVENTIVE NUTRITION

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With the increase in prevalence of major health concerns and never ending list of expensive treatment plans, a change as simple as implementing a healthier diet could come a long way. This review provides a comprehensive analysis of how plant based dietary patterns could significantly improve our lifestyle by mitigating the risks of T2DM, CVD and obesity.This will be done by focusing on the therapeutic and preventive benefits of implementing this type of diet. The article will also address the commonly associated concerns with a complete plant based diet such as quality of protein and sufficiency, iron & Vitamin B12 deficiencies. Plant – based diet are known to be abundant in Vitamins (Vitamin A,Vitamin C, folate, thiamin, riboflavin), Dietary fibers, Minerals (Potassium, Iron, Magnesium) and also are rich in antioxidants, phytochemicals and anti-inflammatory compounds. Vitamin C and dietary fibers could help treat obesity by regulating lipogenesis and inducing the feeling of satiety. The review concludes by putting forth data proving the significant benefits of this diet in reducing key inflammatory biomarkers such as CRP (C -Reactive Protein), reducing the risk of T2DM by regulating key metabolic reactions such as proteolysis, glucotoxicity, glycosylation, lipotoxicity, dyslipidemia & insulin resistance & also aids in establishing a better lipid profile.

Keywords: type 2 diabetes mellitus (T2DM), cardiovascular diseases (CVD), obesity, plant-based diet, nutrition, butyrate, phytochemicals

Introduction

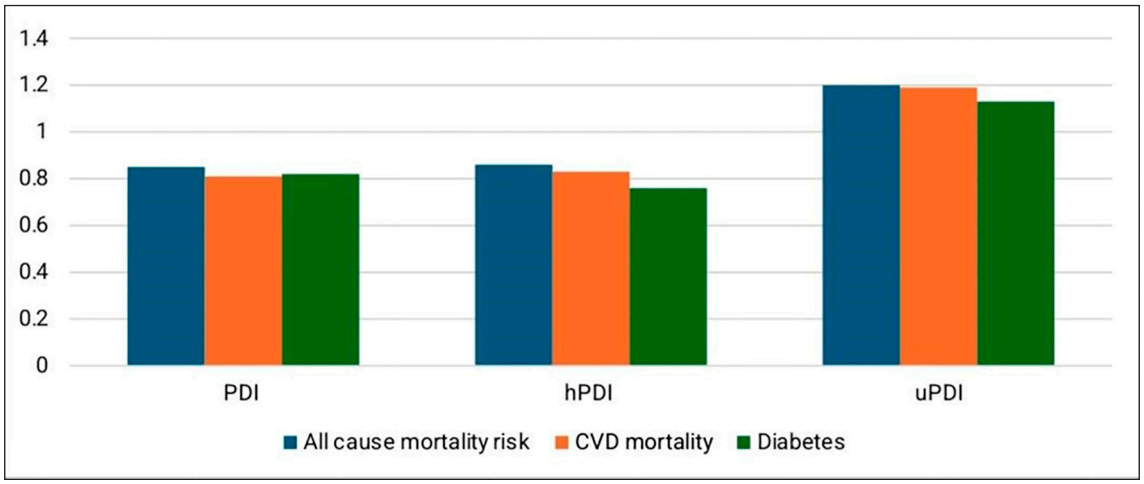
Diabetes, Cardiovascular diseases and Obesity are among the most common and widespread pathologies. Even though CVD and diabetes can be influenced by genetic predisposition, unhealthy diets can play a significant role in the progression & manifestation of these diseases. But it is important to note the interrelation between these pathologies, Obesity could lead to increased insulin resistance, dyslipidemia & inflammations, which leads to an increase in blood glucose levels damaging the blood vessels which in turn leads to manifestation of Diabetes and CVD. Hence focusing on ways to reduce inflammation, insulin resistance and other commonly observed symptoms serves as the key to providing the best possible treatment.

There are multiple different kinds and variations of plant-based diets. Vegan diet – Which focuses mainly on food derived from plants with complete exclusion of animal based products and dairy. Vegetarianism – This type of diet focuses mainly on plant based products but can also include dairy products. Mediterranean diet – Focuses mainly on plant-based foods such as seeds, vegetables, fruits, olive oil for a good source of healthy fats, it also allows minimal consumption of diary,egg & fish. While these are the more widely known types of plant-based dietary patterns, there are other variants too with a specific goal in mind such as EAT-Lancet diet – focusing on establishing a healthy diet and also ensuring sustainability for the planet, DASH (Diet Approach to Stop Hypertension) – Focusing on providing a dietary plan well suited for heart health and reducing blood pressure. Several dietary indexes are also commonly used in literatures to signify the health benefits of these dietary patterns such as – PDI (Plant Based Diet Index), hPDI (Healthy Plant-based Diet Index), uPDI (Unhealthy Plant based Diet Index).

In a study determining the risk off all case mortality & CVD in case of uPDI, hPDI & PDI, uPDI were associated with higher RR (>1) indicating a higher risk of all case mortality & CVD in comparison to PDI & uPDI [1]. The same results were observed in case of Diabetes [2].

Figure shows a graph indicating the relationship between PDI, hPDI & uPDI with respect to risk of mortality measured by HR (Hazard ratio) (HR &RR were used synonymously in the article of reference [1,2]. HR(RR) – >1 (indicates a higher risk), <1 (indicates a reduced risk).

This review will focus on the therapeutic benefits of adopting a plant based diet by focusing on plant based food derivatives such as butyrate and phytochemicals (flavonoids, phenolics and saponins). Followed by preventive benefits of plant based diet in case of Diabetes, Cardiovascular Diseases and Obesity.



The relationship between PDI, hPDI & uPDI with respect to risk of mortality measured by HR (Hazard ratio)

Purpose of the research. The objective of this research aims at providing a comprehensive overview on the health benefits of plant – based diets in optimizing health. This will be done by defining the therapeutic effects of plant based diet and Its role in preventing major health care risks including Type 2 Diabetes Mellitus and cardiovascular pathologies.

Materials and methods of research

This comprehensive overview includes data collected from recently published articles since 2025. The search included cross-sectional studies, longitudinal & systematic reviews to ensure robust data collection and these data were filtered for their relevancy to the core concept of this paper – plant based diet. The articles are filtered using advanced boolean operations – ("plant-based diet" OR vegan OR vegetarian OR "Mediterranean diet") AND ("cardiovascular disease" OR "Type 2 Diabetes Mellitus") AND (prevention OR risk OR impact). The articles are sourced from PubMed, Google Scholar & CORE.

Results of the research and discussions

Therapeutic effects of plant-based food consumption Flavonoids, Saponins, and Phenolics: The Core of Plant-Based Diets

Plant-based dietary patterns are well know for their abundance in major micronutrients such as magnesium, potassium, iron, vitamin C, E and folate. Furthermore, there is another group of nutrients that have shown significant health benefits – Phytochemicals. Flavonoids, Saponins and Phenolics are naturally occurring phytochemicals.

In a research paper on Mulberry leaf extract and its role in management of diabetes [3],Mulberry leaf is a rich source of bioactive flavonoids – It was observed that it regulates glucose-lipid metabolism and terminal amino-acid pathways, which plays a key role in the management of diabetes. Dietary flavonoids are found in herbs, chocolates, vegetables, fruits and plants. Diosmin [4] – A flavonoid shown to exhibit anti-diabetic properties, it does so by reducing the levels of HbA1c (glycosylated haemoglobin), it increases the amount of key enzymes regulating glycolysis – Hexokinases and glucose-6 phosphate dehydrogenases, Increasing activities of glutathione peroxidases – which has a key role in reduction of hydrogen peroxide hence reducing oxidative damage. Fisetin [4] is a flavonoid abundantly found in cucumber, onions, grape and apples shown to have anti-diabetic effects by inhibiting gluconeogenesis, glycogen breakdown and reduce the levels of glycosylated haemoglobin. Flavonoids such as Quercetin & Cyanidin [4] exhibit anti-oxidant properties by increasing levels of anti-oxidant enzymes and improving anti-oxidant status respectively. Chrysin [4] can reduce lipid peroxidation commonly observed due to increased ROS secretion during hyperglycemia.

Studies have shown usage of *Ericaceae* derived phenolic compounds [5] to have anti-diabetic properties. Plants from this family have been observed to contain wide variety of vitamins, sugars, pectin and also phenolic

compounds. Exclusive compounds such as grayanane diterpenes exhibit anti-inflammatory, analgesic and protein tyrosine phosphatase 1B inhibitory activities [5]. Additional they also exhibit potent alpha glucosidase inhibitory effect which aids in slowing down the digestion of carbohydrates hence reducing the instances of postprandial glucose spikes. *Gaultheria* and *Vaccinium vitis-idaea* are abundant in proanthocyanidins and catechins, Inhibit dipeptidyl peptidase-4(DPP-4) which inhibits incretin hormones like GLP-1 [5]. This action improves insulin secretion and hence control glucose levels. Antioxidant properties from extracts of *Ericaceae* family are mainly due to its ability to scavenge excess ROS (Reactive 0xygen Species) and reduces inflammation.

Butyrate Production and its Therapeutic Effects

Plant-based diet are abundant in dietary fibers and the primary product of metabolism of fibers are Short-chain fatty acids (SCFAs), such as Butyrate. Butyrate has a crucial function in plaque stability and reducing inflammation. The precise mechanism by which it performs this function, is mainly through modulating G Protein coupled receptors (GPCR), peroxisome proliferator -activated receptors (PPARs) and histone deacetylases (HDACs) [6]. Butyrate is the preferred fuel for colon cells and are absorbed through MCT-1 (Monocarboxylate transporter 1) & SMCT1(Sodium Monocarboxylate Transporter 1) proteins into the endothelial cells. Here it not only serves as a source of energy but also exhibits a immune function. It is then absorbed into the systemic circulation through portal vein where it performs anti-inflammatory, anti-oxidant and glucose-lipid metabolism regulatory functions. The mechanism through which butyrate performs anti-oxidant function is through inhibition of HDACs, which exposes the DNA to be readily used by the cell. This also allows the NRF2 pathway to work more effectively and activate anti-oxidant genes against the ROS. Butyrates can also regulate PPAR (peroxisome proliferator -activated receptors) which are involved in metabolic regulation mainly through improving usage of insulin, fat storage and fat metabolism. Lower abundance of butyrate producing bacteria are often observed in hypertensive patients. Additionally in a clinical trial, Mean arterial pressure was observed to be significantly reduced in mice when butyric acid along with angiotensin 2 was given [6].

Plant-based Diet and its Regulation of Basic Metabolic Processes

PBD are often prescribed for a diabetic patient, mainly due to its low glycemic index. The reason for this lies behind its abundance in dietary fibres and resistant starch content. They help slow down carbohydrate absorption hence preventing postprandial glucose spikes. Additionally they also play a key role in lipid metabolism since they are good source of healthy unsaturated fats derived from nuts, seeds and oils. This helps to increase the levels of healthy cholesterol (HDL) and lower bad cholesterol (LDL) and triglycerides. Hence it also helps in reducing the levels atherosclerotic lipoproteins reducing inflammation and improve plaque stability. Plant-based diet also exhibit an anti-oxidative effect due to presence of phytochemicals and antioxidants. This helps in reducing the accumulation ROS (Reactive oxygen species) which could otherwise lead to lipid peroxidation. Higher adherence to plant-based diet could prevent chronic hyperglycemia, hence preventing the excessive accumulation AGEs (advanced glycation end-products) on the RBC membrane mainly due to increased glycosylation. The increased glycosylation results in the RBC cell membrane becoming more rigid preventing its normal functioning [7].

Plant based foods for preventive nutrition

The 10 studies included below in Table helps in establishing the relation between plant-based diet and its effects on obesity, weight management, cardiovascular pathologies and diabetes. This list includes systematic reviews, longitudinal reviews, cohort and cross-sectional studies, case studies and meta-analyses.

The main findings from this table indicates the possible benefits of plant-based diets in reducing the risk of T2DM, CVD and Obesity, and also helps in improving the gut microbiome. Additionally it aids in reducing inflammation and oxidative stress and improve endothelial function of blood vessels.

Plant Based Diet (PBD) and its interactions with the genetic components of cardiovascular diseases

Individuals who are genetically pre-disposed to cardiovascular diseases could benefit from switching towards a plant based diet. PBD could lower the classical biomarkers observed during cardiovascular diseases. Moreover it can reduce the risk factors associated with the gene CAV-1 & MC4R which are involved in fat distribution and energy balance.

Includes 10 articles based on Plant based diets and its role in preventive treatment

No	Articles	Type of Study	Year of Publication	Dietary Patterns	Main Findings
1	Plant-Based Diets and Their Role in Preventive Medicine: A Systematic Review of Evidence-Based Insights for Reducing Disease Risk	Systematic review	06/02/2025	Overall Plant-Based Diet (PDI) Healthy Plant-Based Diet (hPDI) Unhealthy Plant-Based Diet (uPDI)	The benefit of implementing plant based diet in reducing the risk of Type 2 Diabetes, cardiovascular diseases and maintaining gut health by promoting growth of gut microbiome. It also highlights the need for further long term research and inclusion of various cultural contexts [8].
2	Adherence to plant-based diets and long-term changes in cardiometabolic markers: a longitudinal analysis in a population-based cohort	Longitudinal review including individuals from netherlands free of diabetes and hypertension at the baseline respectively [9]	30/05/2025	Healthy Plant-Based Diet (hPDI)	Higher hPDI (healthy plant based diet index) was associated with lower SBP, DBP, fasting glucose, total :HDL cholesterol ratio and increased HDL over a varied period of time[9].This demonstrate reduced levels of cardio-metabolic markers indicating significant reduction in occurrence of cardio-metabolic risk
3	Prospective association of the EAT-Lancet reference diet with body weight changes and incidence of overweight and obesity in a French cohort	The study included 51,711 adults who participated in French NutriNet-Santé cohort between 2009 and 2023 [10]. The relationship between EAT Lancet Diet Index and changes in body weight were determined.	17/06/2025	EAT-Lancet reference diet	EAT Lancet Diet promotes the consumptions of plant based food and reduction in consumption of processed and meat products.Within a cohort of 51,711 individuals,during follow up 5854 individuals became overweight and obese [4250(overweight) and 1604(Obese)]. Hence lower level of adherence to this diet was accompanied by higher risk of obesity [10].
4	Influence of a Vegan Diet on Child Health and Development: A Scoping Review	A systematic review included 27 articles which high relevancy, strictly adhering to vegan diet and excluding articles referring to OM (Omnivorous) and VG (vegetarian) diets.	24/05/2025	Vegan Diet Plant Based Diet	Vegan diet have lower total HDL and LDL cholesterol suggesting reduced risk of cardiovascular diseases. Well planned vegan diet has also proved to reduce the cases of obesity. It also suggests no significant negative impact on normal growth and development when planned well with adequate supplementation. Vegan diet are often associated with low intake of Vitamin B12, Vitamin D, iron, iodine and specific amino acids [11]. Hence adequate supplementation is necessary.
5	Editorial: Flavonoids, phenolics, and saponins in the diet for prevention and management of type 2 diabetes	A Review focusing on the benefits of plant based food in treating Type 2 Diabetes Mellitus. It includes articles published on foods rich in phytochemicals such as flavonoids, saponins [3,12] and their significance in treating Type 2 Diabetes mellitus.	09/06/2025		Plant based food derivatives including phytochemicals such as flavonoids and saponins have shown positive effects in regulation glucose-lipid metabolism and terminal amino acid pathways crucial for treating Type 2 Diabetes. Phytochemicals also help in improving the efficiency of therapeutic drugs.

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No	Articles	Type of Study	Year of Publication	Dietary Patterns	Main Findings
6	Interaction of genetic risk score (GRS) and Plant-Based diet on atherogenic factors and body fat distribution indices among women with overweight and obesity: a cross-sectional study	The cross sectional study involved 377 women from Tehran, Iran.The participants aged 18 – 48 with a BMI of 25-40 kg/m² [13] with no history of conditions such as pregnancy, Type 2 Diabetes Mellitus, thyroid illness and kidney or liver diseases. Also women using supplements and weight loss programs were excluded. The study focused on determining the relation between PDI (plant based diet) and GRS (genetic risk score) through calculating atherogenic index of plasma (AIP).	08/07/2025	Plant-Based Diet Index (PDI) Healthy Plant-Based Diet Index (hPDI) Unhealthy Plant-Based Diet Index (uPDI)	The study demonstrates that plant based diet can significantly reduce influence of cardiovascular risk factors.The research also shows that PDI helps in lowering triglycerides and regulate HDL which is a major component of AIP (Atherogenic index of plasma). Other indexes such as VAT (Vascular adipose tissue) and LAP (Lipid Accumulation Product)(commonly associated with cardiovascular diseases) were shown to be reduced with implementation of PDI.
7	The impact of dietary patterns on gut microbiota for the primary and secondary prevention of cardiovascular disease: a systematic review	This is a systematic review and meta analysis aimed at further enhancing the understanding of plant based diet and its significance in reducing the risk of CVD (Cardiovascular Disease). 19 Studies were included comprising of data collected from population aged 18 or older with cardiovascular diseases or those at risk of developing them later on. Studies including the use of gut microbiome modulators such as prebiotics, probiotics or synbiotics were excluded.	28/01/2025	Plant-rich diets Restrictive diets Polyphenol-rich diets	Dysbiosis of gut microbiome could have a significant effect on the progression of cardiovascular diseases such as atherosclerosis, heart failure and stroke [14]. A plant based diet was shown to increase the abundance of butyrate producing bacteria, including *Faecalibacterium prausnitzii* and *Roseburia*, which are known for having a protective role against CVD. Furthermore Mediterranean diet consisting of resistant starch (RS) in abundance has been shown to aid in the proliferation of *Faecalibacterium prausnitzii*.
8	Influence of Vegetarian and Non-vegetarian Diets on hs-CRP Levels, Lipid Profiles, and Cardiovascular Health in Adults	This is a case – control study conducted in Maharashtra, India. 70 participants were included between the ages of 25 – 45, with an equal distribution of vegetarians and non-vegetarians. The study was conducted for seven years and at the end their hsCRP levels and Lipid profile were measured.	17/05/2025	Vegetarian Diet	C-reactive protein (hs-CRP) has been constantly associated with cardiovascular pathologies henceforth becoming a important biomarker of the disease. Vegetarian diet indicates lower hs-CRP levels when compared to a non-vegetarian diet. Decreased CRP levels have also been associated with increased intake of carotenoids, vitamin C and vegetables and fruits. Vegetarian diet can also improve lipid profile and reduce inflammations [15]

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No	Articles	Type of Study	Year of Publication	Dietary Patterns	Main Findings
9	The Impact of Plant-Based Diets on Erythrocyte Function, Oxidative Stress, and Vascular Inflammation in Type 2 Diabetes Mellitus	This is a literature review focused on examining the benefits of plant based dietary patterns in preventing Type 2 Diabetes Mellitus and also diabetes associated atherosclerosis.	May 2025	Vegan Diet Lacto-ovo Vegetarian Diet Ovo-vegetarianism Pescatarian Diet Flexitarian (or Semi-vegetarian) Diet Western Omnivore (SAD) Diet	Plant based diets plays a key role in reducing insulin resistance and vascular health by enhancing ability of RBC to modulate their shape, which is significantly impaired during Diabetes. In diabetes induced chronic hyperglycemia, accumulation of AGEs due to accelerated non-enzymatic glycosylation[7] in the membrane of the RBC leads to increased rigidity of the membrane – hence impairing its function. Opting for a plant based diet could reduce the risk of T2DM by regulating key metabolic reactions such as proteolysis, glucotoxicity, glycosylation, lipotoxicity, dyslipidemia & insulin resistance.
10	Plant-based and sustainable diet: A systematic review of its impact on obesity	This systematic review includes 7 articles selected after intensive screening for relevance.	29/01/2025	EAT-Lancet reference diet Unhealthy Plant-Based Diet Index (uPDI) Western Diet	RCT's indicated a Greater Mean BMI reduction in those following whole plant-based diet than those on a normal diet at 6 months [16]. In another clinical trial,Both Low Fat Plant based diet (LFPB) & Low- carbohydrate diet (LC) had no significant impact on lean mass. But LFPB diet showed significant fat mass reduction when compared to LC diet. In a Clinical trial including participants with overweight or obesity -those with Higher Adherence to PBD were associated with lower weight gain than those with Lower PBD Adherence.Additionally, Anti-inflammatory diets were associated with lower risk of obesity when compared to pro-inflammatory diet."Western Diet" & "uPDI" were also shown to have a higher risk of obesity.

Significance of Plant-based Diet in Mitigating Cardiovascular Disease t hrough Gut Microbiome Modulations (The Gut-Heart Axis)

Plant based diet and Mediterranean diets have shown promising effects in modulating the gut microbiome by providing a rich source of Resistance starch and Dietary fibers. These help in proliferation of butyrate producing *Faecalibacterium prausnitzii & Roseburia* species. Butyrate is crucial short chain fatty acid (SCFA), prominently produced by *Faecalibacterium prausnitzii*. Reduced production of butyrate and lower count of *Faecalibacterium prausnitzii* has been observed in Hypertensive patients.Butyrate plays a important role in enhancing the plaque stability and decreasing the adherence pro-inflammatory macrophages [14].

Roseburia associated butyrate production could also reduce the size of the plaque without impacting the cholesterol and triglyceride levels. Butyrate also plays a key role in reducing cholesterol levels by stimulating production of lipo-protein apoA-IV, hence facilitating reverse – cholesterol transport. Additionally *Roseburia* can also activate fatty acid oxidation and inhibit lipolysis, hence reducing the amount of lipid plasma levels.

Role of Plant based diet in reducing key inflammatory biomarkers

Inflammation have been associated with both the Type 2 Diabetes and Cardiovascular diseases making it a significant concern.CRP is normally produced by liver, but inflammatory diseases and trauma can also trigger an increase in CRP levels. Normally CRP levels remain constant since they are not influenced by the quantity of food or time of consumption. Diet prioritizing higher intake of Vitamin C, carotenoids, vegetables and fruits have been associated with lower levels of circulating hsCRP (high-sensitivity C-reactive protein). However in another study [17] deducing the possible relationship between PBD, CRP levels and inflammation, reduced hs-CRP levels associated with reduced inflammation was shown to not be the only key benefit of PBD in having a higher health-related quality of life (HRQoL).

Reasons for prevalence of plant-based dietary patterns in treatment of diabetes

Evidence suggest PBD plays a crucial role in reducing inflammation, oxidative stress and metabolic dysfunctions, which are commonly associated with chronic diseases such as diabetes.Additionally, higher adherence to a hPDI diet has been associated with improved insulin sensitivity and reduced instances of insulin resistance. Moreover its helps in stabilizing blood glucose levels, indicated by lower HbA1C levels. It is able to do so due to the high fiber content, which slows down glucose absorption hence preventing blood sugar spikes. These benefits are more commonly observed in plant based diets that follow a lower carbohydrate consumption. Risk of getting diabetes is reduced by up to 34% [8] in individuals following a well planned plant-based diet.

Role in obesity treatment

In addition to anti-inflammatory effects with respect to T2DM & CVD, Plant Based Diet has also shown promising results in combating obesity. A well optimized plant based diet consisting of whole foods when followed with strict adherence can significantly reduce fat mass and also prevent weight gain [18]. Participants with higher adherence to a uPDI (unhealthy Plant Based Diet) have shown to be at higher risk for abdominal obesity, about 16-24 % [16]. Nut consumption has been associated with Lower HbA1c (glycated haemoglobin indicating blood glucose levels), total cholesterol and LDL-c, Fruit have shown to lower the Total Cholesterol, LDL-c & Diastolic blood pressure [16]. Vegetables with higher dietary fibers have been shown to decrease Diastolic blood pressure, triglyceride levels and increase HDL-c levels. A higher hPDI has shown to significantly reduce risk of hypertension. Lower consumption of potassium, iron, vitamin C, folate, beta-carotene, and dietary fiber can disrupt the general mechanisms of Adiposity.It has been observed that – Vitamin C plays a role in reducing obesity by regulating lipogenesis. It works so by suppressing the genes involved in the lipogenesis and also by preventing the enlargement of visceral fat cells. Additionally, Dietary Folate deficiency can also increase leptin production & Lipid accumulation.

Dietary Fiber consumption have also shown to reduce instances of obesity, possibly due to increased satiety, effect on the gut microbiome and also gut hormones.

Conclusions

The benefits of plant-based diets in therapeutic and preventive treatment are promising. Higher adherence to a healthy plant-based diet with proper supplementation of all the essential vitamins, minerals and macronutrients can help treat and prevent Diabetes, CVD & Obe-

sity by reducing insulin resistance, LDL and Total cholesterol levels, Triglycerides, Hyperglycemia, HbA1c (glycated haemoglobin) levels, endothelial dysfunction,inflammation and oxidative stress.

Plant based diet have also been linked to better gut microbiome, which improves cardiovascular functioning by reducing inflammations, oxidative stress and increasing the amount of butyrate producing bacteria's. Hence establishing a crucial link between the gut microbiome and the heart – The Gut-Heart Axis.

However, further research could be beneficial to fully understand the underlying mechanism of these benefits and expand our understanding of plant based dietary intervention.

References

1. Mo Q., Wu J., Lu Y., Zhang X. Plant-based diets and total and cause-specific mortality: a meta-analysis of prospective studies // Frontiers in Nutrition. 2025. Vol. 12. DOI: 10.3389/fnut.2025.1518519.

2. Murciano A., Malavolti M., Fairweather-Tait S., Paduano S., Vinceti M., Filippini T. Plant-based diets and risk of type 2 diabetes: systematic review and dose-response meta-analysis // British Journal of Nutrition. 2025. P. 1-53. DOI: 10.1017/S0007114525104157.

3. Yang L.L., Xiao N. Editorial: Flavonoids, phenolics, and saponins in the diet for prevention and management of type 2 diabetes // Frontiers in Nutrition. 2025. Vol. 12. DOI: 10.3389/fnut.2025.1611238.

4. Chandra Mohan S., Jain N., Sumathi S. Mechanisms of Action of Flavonoids in the Management of Diabetes mellitus // J. Drug Delivery Ther. 2021. Vol. 11. No. 5-S. P. 194-202. DOI: 10.22270/jddt.v11i5-s.5101.

5. Popescu M., Radivojevic K., Trasca D.M., Varut R.M., Enache I., Osman A. Natural Antidiabetic Agents: Insights into Ericaceae-Derived Phenolics and Their Role in Metabolic and Oxidative Modulation in Diabetes // Pharmaceuticals (Basel). 202. Vol. 18. No. 5. P. 682. DOI: 10.3390/ph18050682.

6. Xu Q., Liu X., Wang Z., Li X., Jiang Q., Xu M. Recent advancements and comprehensive analyses of butyric acid in cardiovascular diseases // Frontiers in Cardiovascular Medicine. 2025. Vol. 12. № 1608658. DOI: 10.3389/fcvm.2025.1608658.

7. Craig W.G. The impact of plant-based diets on erythrocyte function, oxidative stress, and vascular inflammation in Type 2 Diabetes Mellitus: Cal Poly Humboldt theses and projects, 2025. P. 2270. URL: https://digitalcommons.humboldt.edu/etd/2270/ (date of access: 15.05.2025).

8. Almuntashiri S.A., Alsubaie F.F., Alotaybi M. Plant-Based Diets and Their Role in Preventive Medicine: A Systematic Review of Evidence-Based Insights for Reducing Disease Risk // Cureus. 2025. Vol. 17. No. 2. P. e78629. DOI: 10.7759/cureus.78629.

9. Voortman T., van der Schaft N., Mook-Kih S., et al. Adherence to Plant-based Diets and Long-term Changes in Cardiometabolic Markers: a Longitudinal Analysis in a Population-based Cohort // American Journal of Clinical Nutrition. DOI: 10.1016/j.ajcnut.2025.05.012.

10. Berthy F., Toujgani H., Duquenne P., et al. Prospective association of the EAT-Lancet reference diet with body weight changes and incidence of overweight and obesity in a French cohort // American Journal of Clinical Nutrition. 2025. Vol. 122. No. 2. P. 450-459. DOI: 10.1016/j.ajcnut.2025.06.013.

11. Brits E., le Grange E. Influence of a Vegan Diet on Child Health and Development: A Scoping Review // Nutrition Reviews. 2025. DOI: 10.1093/nutrit/nuaf070.

12. Lv B, Liu S, Li Y, et al. Mulberry leaf ameliorate STZ induced diabetic rat by regulating hepatic glycometabolism and fatty acid β-oxidation // Frontiers in Pharmacology. 2024. Vol. 15. DOI: 10.3389/fphar.2024.1428604.

13. Hajmir MM, Mirzababaei A, Abaj F, et al. Interaction of genetic risk score (GRS) and Plant-Based diet on atherogenic factors and body fat distribution indices among women with overweight and obesity: a cross-sectional study // Scientific Reports. 2025. Vol. 15. No. 1. P. 24405. DOI: 10.1038/s41598-025-09726-0.

14. Yu J., Wu Y., Zhu Z., et al. The impact of dietary patterns on gut microbiota for the primary and secondary prevention of cardiovascular disease: a systematic review // Nutrition Journal. 2025. Vol. 24. P. 17. DOI: 10.1186/s12937-024-01060-x.

15. Chakole S., Anjankar N., Anjankar A., et al. Influence of Vegetarian and Nonvegetarian Diets on hs-CRP Levels, Lipid Profiles, and Cardiovascular Health in Adults // Journal of Pharmacy and Bioallied Sciences. 2025. Vol. 17. No. 1. P. S284-S286. DOI: 10.4103/jpbs.jpbs_470_25.

16. Mambrini S.P., Penzavecchia C., Menichetti F., et al. Plant-based and sustainable diet: A systematic review of its impact on obesity // Obesity Reviews. 2025. DOI: 10.1111/obr.13901.

17. Schorr K., Beekman M., Agayn V., de Vries J.H.M., de Groot L.C.P.G.M., Slagboom P.E. A healthful plant-based diet is associated with higher health-related quality of life among older adults independent of circulating CRP: a cross-sectional analysis from the Lifelines Cohort Study // Journal of Nutritional Science. 2025. Vol. 14. P. e54. DOI: 10.1017/jns.2025.10023.

18. Pietrusińska P., Dziewierz A., Sobiński A., et al. Plant-based diet – influence on general health // Quality in Sport. 2025. Vol. 41. P. 60086. DOI: 10.12775/QS.2025.41.60086.