

# **Journal of Clinical** Nutrition and Metabolism

### Short Communication

## The Influence of Omega-3 Fatty Acids on Cardiovascular Health and Metabolic Function

#### **Emily Bennett\***

Department of Clinical Sciences, King's College London, London, United Kingdom \*Corresponding Author: Emily Bennett, Department of Clinical Sciences, King's College London, London, United Kingdom; E-mail: ben.emily4756@edu.uk

Received date: 26 August, 2024, Manuscript No. JCNM-24-148271;

Editor assigned date: 28 August, 2024, PreQC No. JCNM-24-148271 (PQ);

Reviewed date: 12 September, 2024, QC No. JCNM-24-148271;

Revised date: 20 September, 2024, Manuscript No. JCNM-24-148271 (R);

Published date: 30 September, 2024, DOI: 10.35841/JCNM.1000149

#### Description

Omega-3 fatty acids have long been associated with various health benefits, particularly in the territory of cardiovascular health. These polyunsaturated fats, primarily found in fish like salmon, mackerel and sardines, as well as in flaxseed and walnuts, play a significant role in maintaining the body's metabolic balance. Their impact on cholesterol levels, inflammation and triglyceride reduction has made them an essential focus of research, particularly regarding cardiovascular diseases and metabolic disorders such as diabetes. One of the most widely recognized benefits of omega-3 fatty acids is their contribution to heart health. Studies have demonstrated that individuals who consume higher amounts of omega-3s tend to have lower risks of developing coronary heart disease and other cardiovascular complications. Omega-3s are known to reduce triglyceride levels, which are a key factor in heart disease. Elevated triglycerides can contribute to the development of atherosclerosis, where plaques build up inside the arteries, increasing the risk of heart attacks and strokes [1-2].

In addition to lowering triglycerides, omega-3 fatty acids improve endothelial function, which refers to the health of the inner lining of blood vessels. Better endothelial function allows for smoother blood flow and reduces the likelihood of blood clot formation. Omega-3s also help regulate heart rhythms, offering protection against arrhythmias, which can be life-threatening. These combined effects explain why omega-3s are often recommended for cardiovascular health maintenance and for patients recovering from heart-related events. Inflammation plays a critical role in both cardiovascular diseases and metabolic disorders. Chronic low-grade inflammation is a hallmark of many diseases, including atherosclerosis, diabetes and obesity. Omega-3 fatty acids exert potent anti-inflammatory effects by reducing the production of inflammatory molecules known as cytokines. These fatty acids can modulate the body's immune response, curbing excessive inflammation that might otherwise contribute to tissue damage and metabolic dysfunction [3,4].

For instance, in conditions like metabolic syndrome, a cluster of risk factors that include increased blood pressure, elevated blood sugar and abnormal cholesterol levels, omega-3 supplementation has shown beneficial effects. By lowering inflammatory markers, omega-3s help reduce the risk of insulin resistance and type 2 diabetes, both of which are closely tied to inflammation. Omega-3s have a positive impact on

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cholesterol regulation, particularly by increasing levels of High-Density Lipoprotein (HDL) cholesterol. HDL is considered the "good" cholesterol because it helps transport cholesterol away from the arteries and back to the liver, where it can be metabolized. A favorable HDL level can lower the risk of plaque formation in arteries, further reducing cardiovascular disease risk [5,6].

Additionally, omega-3 fatty acids help regulate blood pressure, which is another critical factor in heart health. They contribute to vasodilation, the relaxation and widening of blood vessels, which allows blood to flow more freely and reduces pressure on arterial walls. As a result, individuals who consume adequate amounts of omega-3s are less likely to suffer from hypertension, a major risk factor for stroke and heart attack. Beyond their cardiovascular benefits, omega-3s are also important for metabolic function. They play a role in insulin sensitivity, which is important for maintaining healthy blood sugar levels. Omega-3s have been shown to improve insulin signaling in the body, making it easier for cells to absorb glucose from the bloodstream. This has important implications for individuals at risk of or managing type 2 diabetes [7,8].

Moreover, omega-3 fatty acids may help with fat metabolism and the prevention of obesity-related complications. By influencing the body's ability to oxidize fat and reducing fat storage in the liver, omega-3s can help improve overall metabolic health. This is particularly relevant in combating non-alcoholic fatty liver disease, a condition often linked with obesity and metabolic syndrome. To reap the benefits of omega-3 fatty acids, it is essential to include them regularly in the diet. Fatty fish such as salmon, sardines and mackerel are excellent sources. For those who do not consume fish, plant-based options such as flaxseed, chia seeds and walnuts provide Alpha-Linolenic Acid (ALA), a precursor to the active forms of omega-3s, Eicosapentaenoic Acid (EPA) and Docosahexaenoic Acid (DHA) [9,10].

Supplements can also be an effective way to increase omega-3 intake, especially for individuals at higher risk of cardiovascular disease or those with difficulty incorporating enough omega-3-rich foods into their diets. However, it is important to consult a healthcare provider before starting supplementation, as excessive intake can have adverse effects, particularly on bleeding time. Omega-3 fatty acids offer significant advantages for both cardiovascular health and metabolic function. Their ability to lower triglycerides, reduce inflammation, improve cholesterol levels and support blood pressure control makes them a valuable addition to any diet, particularly for individuals with or at risk of heart disease and metabolic disorders.

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