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Editorial

# Effect of Carboxymethylcellulose Hydrogels on the Preservation of Polyphenols

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## ABOUT THE STUDY

Cardiovascular disease, stroke, cancer, diabetes, Alzheimer's disease, and other aging-related diseases are all caused by oxidative stress. Consumption of fruits and vegetables on a daily basis lowers the risk of developing these diseases. Because customers are becoming more aware of the relevance of tart cherries and the products they consume, their production is expanding as well. Polyphenols and anthocyanin, for example, are highly valuable components. Regular tart cherry consumption cures arthritic and gout pain, enhances visual and cognitive functioning, and lowers obesity, diabetes, oxidative stress, inflammation, blood pressure, strength loss, and exercise-induced fatigue.

Anthocyanins are polyphenols that belong to the flavonoid family. They are pigments found in fruits and vegetables that act as carriers of antioxidant and anti-inflammatory activities. Any compound's antioxidant activity is determined by its capacity to trap free radicals using a donor hydrogen atom. Anthocyanins' red-violet colour is significant for determining food quality as well as marketing objectives. Their most important role, however, is to provide colour to the plants in which they appear. Anthocyanins are anthocyanin's glycosides, which are aglycone units. They are glycoside-linked and consist of two aromatic rings bonded by three carbons in the chromatin ring, an oxygenated heterocycle. The stability of secondary metabolites in plant materials is influenced by processing technologies. Their stability, bioavailability, and solubility are further affected by their interactions with other components in the food matrix.

Phenolic chemicals are frequently exposed to heat, light, and oxygen during fruit preparation, hastening their breakdown. It is vital to develop appropriate delivery systems that can offer oxidation resistance and protection from undesired external impacts in order to keep these high-valued components. In order to preserve anthocyanins and other unstable components in food systems, the food industry must develop innovative ways. For the protection of bioactive substances, a variety of delivery strategies can be used, with hydrogels being one of them. The polymeric components that make up the three-dimensional network structure of hydrogels allow them to store huge amounts of water. Some polysaccharides utilised in the encapsulating process include Carboxymethylcellulose (CMC), alginates, pectin, and chitosan. CMC has a wide range of uses in the food, pharmaceutical, paper, and textile sectors due to its non-toxic, bio-adhesive, and pH-sensitive qualities. CMC, unlike other polysaccharides, has unique hydrophilic properties due to the presence of carboxylate groups in its structure. In situ gelation, sensitivity to external stimuli, controlled release, and bio-adhesion can all be obtained as a result of it. CMC does not appear to be harmful, according to reports. However, if higher doses of CMC are used in the food sector, their use should be restricted due to a suspected link to obesity that needs to be investigated further. When making CMC hydrogels, vigorous agitation is required since quick hydration might result in lumps and undesirable agglomeration.

CMC is utilized as a food stabilizer in cocoa drinks, ice creams, and baked items in the food business. It slows the formation of ice crystals in ice creams and sugar crystals in syrups and confections. It's also a promising medicine delivery vehicle. CMC networks can absorb and release vast amounts of water or other desired fluids under controlled settings. We looked into using CMC hydrogels as delivery vehicles for tart cherry juice (TJ) polyphenols to meet the needs of the fruit sector while also preserving nutritionally significant components in food systems. Hydrogels were made with various levels of CMC to see if the amount of CMC has an effect on the retention of phenolics during the preparation process.

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