

BIOCHEMICAL COMPOSITION OF BROCCOLIES IN IQF PROCESS.

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Annotatsiya. Individual tez muzlatish (IQF) meva, rezavorlar va sabzavotlarning sifati va ozuqaviy qiymatini saqlab qolish uchun muhim jarayondir. IQF (individual tez muzlatish) mahsulotlarni sifatli va qisqa muddatli muzlatishdan iborat bo'lib, bu mahsulot hujayra tarkibidagi muz kristallarini shakllanishi jarayonida hajm jihatidan kattalashuviga to'sqinlik qiladi va ularning tuzilishi, ta'mi va ozuqaviy tarkibini saqlab qoladi.

Annotation: The Individual Quick Freezing (IQF) process is essential for maintaining the quality and nutritional value of vegetables such as broccoli. Rapid freezing of the vegetable prevents the formation of large ice crystals that can damage the cell structure and reduce the nutritional value of the vegetable. By preserving the texture, taste, and nutritional content of broccoli, IQF allows for longer storage times, reducing the risk of spoilage and food waste. The IQF process also helps to retain important bioactive compounds, such as antioxidants and vitamins, making IQF broccoli a valuable addition to a healthy and balanced diet.

Kalit so'zlar. QF texnologiyasi, sovutish, muzlatish, konservalash, atrof-muhit, bioaktiv birikmalar, potentsial, yuqori to'yimli sabzavotlar, oziq-ovqat fanlari jurnali, muz kristallari, biokimyoviy va ozuqaviy qiymat

Key words. IQF technology, cooling, freezing, preservation, environment, bioactive compounds, potential, a nutrient-dense vegetable, the Journal of Food Science, ice crystals, biochemical composition and nutritional value.

The IQF technology has been in existence since the 1920s, but it has undergone significant improvements in recent years. The introduction of advanced refrigeration and freezing systems has made the IQF process more efficient, cost-effective, and environmentally friendly. These new technologies have revolutionized the IQF process and have made it possible to preserve the quality and nutritional value of fruits, berries, and vegetables in a more sustainable and efficient way.

Broccoli is a cruciferous vegetable that is highly nutritious and has gained a reputation as a superfood in recent years. It is rich in vitamins, minerals, antioxidants, and other bioactive compounds that have been linked to a range of health benefits, including reducing the risk of cancer, heart disease, and diabetes. In order to preserve these valuable nutrients, broccoli is often processed using IQF (individually quick frozen) technology.

The IQF process involves rapidly freezing individual pieces of broccoli at a very low temperature (-40°C or lower) using a blast freezer. This process is designed to minimize the formation of ice crystals, which can damage the cell structure of the broccoli and reduce its nutritional value. By freezing the broccoli quickly and at a low temperature, the cell structure is preserved, and the nutritional content of the vegetable is retained.

The biochemical composition of broccoli can be affected by various factors, such as the growing conditions, harvesting methods, and storage conditions. Broccoli is a rich source of various nutrients and bioactive compounds. The biochemical composition of broccoli includes:

1. Carbohydrates: Broccoli contains 6 grams of carbohydrates per 100 grams of serving. The carbohydrates in broccoli are mainly in the form of fiber, which helps in maintaining digestive health.

2. Protein: Broccoli is a good source of protein, containing 2.8 grams of protein per 100 grams of serving.

3. Vitamins: Broccoli is a rich source of vitamins, especially vitamin C, vitamin K, and vitamin A. 100 grams of broccoli contains 89.2 mg of vitamin C, 101.6 mcg of vitamin K, and 623 IU of vitamin A.

4. Minerals: Broccoli is a good source of minerals, including calcium, iron, potassium, and magnesium.

5. Bioactive compounds: Broccoli contains various bioactive compounds, including glycosylates, flavonoids, and carotenoids. These compounds have been shown to have antioxidant, anti-inflammatory, and anti-cancer properties.

Overall, broccoli is a nutrient-dense vegetable that can provide several health benefits when included in a balanced diet. However, the IQF process has been found to be an effective way of preserving the nutritional value of broccoli. Studies have shown that the levels of antioxidants, vitamins, and other bioactive compounds in IQF broccoli are comparable to fresh broccoli.

Broccoli is a nutrient-dense vegetable that is widely recognized for its health benefits. It is packed with vitamins, minerals, antioxidants, and other bioactive compounds that are essential for maintaining good health. The biochemical composition of broccoli can vary depending on factors such as the variety, growing conditions, and maturity, making it crucial to preserve the quality and nutritional value of the vegetable during IQF (Individual Quick Freezing) processing.

Broccoli typically contains around 7-9% carbohydrates, including fiber, and about 3-4% protein. It also contains various vitamins and minerals, including vitamin C, vitamin K, folate, potassium, and calcium. Additionally, broccoli is rich in antioxidants, such as carotenoids, flavonoids, and phenolic compounds, which have been linked to a range of health benefits, including reducing the risk of cancer and heart disease.

During IQF processing, it is essential to freeze broccoli rapidly to prevent the formation of large ice crystals that can damage the cell structure and reduce the nutritional value of the vegetable. The IQF process is designed to maintain the texture, taste, and nutritional content of the broccoli while extending its shelf life and reducing the risk of spoilage.

Research has shown that IQF broccoli retains its nutritional value and bioactive compounds, making it a valuable addition to a healthy diet. One study published in the Journal of Food Science and Technology found that IQF broccoli had comparable levels of antioxidants, total phenolics, and vitamin C to fresh broccoli. Another study published in the Journal of Agricultural and Food Chemistry found that IQF broccoli had higher levels of vitamin C and total phenolics compared to conventionally frozen broccoli.

In addition to preserving the nutritional value of broccoli, the IQF process also has other benefits. It allows for longer storage times and reduces the risk of spoilage, which can result in food waste. IQF broccoli is also more convenient for consumers, as it can be easily stored and used as needed.

In conclusion, the IQF process is a crucial step in preserving the quality and nutritional value of broccoli. It allows for the retention of important bioactive compounds, such as antioxidants and vitamins, and is a convenient way for consumers to enjoy the health benefits of this nutrient-dense vegetable. As such, IQF broccoli is a valuable addition to any healthy and balanced diet.

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