



Innovative Techniques for Food Processing and Cold Plasma Pre-Treatment

Zengling Tao*

Department of Food processing, Estonian University of Life Sciences, Tartu, Estonia

DESCRIPTION

Food processing is an integral part of the food industry, and it is important to ensure that food products are safe and nutritious. In recent years, more advanced techniques have been developed to help improve the quality of food products. One such technique is cold plasma pre-treatment, which has the potential to revolutionize food processing by providing improved safety and nutrition. Cold plasma pre-treatment is a process in which a cold gas mixture containing trace amounts of oxygen, nitrogen, or other gases is exposed to an electric field. This electric field causes ions to be formed from the gas molecules, which then interact with each other and with surfaces of materials in contact with them.

This interaction can cause changes in the structure of materials, including altering their chemical composition or modifying their surface properties. The potential benefits of cold plasma pre-treatment for food processing include improved sanitation and safety standards, as well as improved nutritional value. By exposing food products to a cold plasma atmosphere before they are processed, it may be possible to reduce or eliminate harmful bacteria and other contaminants that could otherwise contaminate food products during their processing. Additionally, cold plasma pre-treatment can alter the chemical composition of some foods, such as fruits and vegetables, potentially increasing their nutritional value. In addition to these potential benefits for food safety and nutrition, cold plasma pre-treatment could also provide cost savings in terms of energy consumption during food processing. By reducing or eliminating the need for additional treatments or sterilization processes that require energy inputs, it may be possible to reduce overall energy costs associated with food production.

Food safety and quality are essential aspects of the food processing industry. To ensure these standards are met, many food processors have turned to cold plasma pre-treatment as a way to improve their processes. Cold plasma pre-treatment is a method that utilizes a combination of electrical and chemical energy to create an environment that can help reduce microbial

contamination, increase shelf life, and improve product quality. Cold plasma pre-treatment has several advantages over traditional methods of food processing. It is safe and non-destructive. It does not require high temperatures or harsh chemicals, making it ideal for sensitive products such as fruits and vegetables. It eliminates potential sources of contamination since it does not generate heat or aerosols which can be spread bacteria or other contaminants throughout the facility.

The cold plasma pre-treatment is fast and efficient compared to traditional methods, allowing food processors to quickly produce large quantities of high-quality products. Furthermore, cold plasma pre-treatment can also be used to improve the nutritional value of foods by increasing the absorption rate of vitamins and minerals. This helps food processors create healthier products while still maintaining superior quality standards. Additionally, cold plasma pre-treatment can also be used as an effective cleaning agent by removing dirt and debris from surfaces without damaging them in any way. Cold plasma pre-treatment is an excellent choice for food processors looking to improve their processes while maintaining safety and quality standards. Cold plasma pre-treatment has become increasingly popular as a means of improving food processing. This form of pre-treatment uses cold atmospheric pressure plasmas, which are generated by applying a high voltage electric field to the air or gas surrounding the food material.

This technology can be used to improve food safety, extend shelf life, and reduce energy consumption during processing. However, there are still some challenges and limitations that need to be addressed when using this technology in food processing. One of the main challenges is the cost associated with cold plasma pre-treatment. The equipment required for this process can be expensive, and the costs may outweigh the potential benefits for some processors. Additionally, it can take a long time to set up and configure the equipment properly for optimal performance. This may make it difficult for processors to implement this technology in their operations if they have

Correspondence to: Zengling Tao, Department of Food processing, Estonian University of Life Sciences, Tartu, Estonia, E-mail: zenglingtao98@gmail.com

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limited resources or time constraints. Another challenge is that cold plasma pre-treatment does not work on all types of materials or food products. It is only effective on certain types of materials such as polymers and nonpolar compounds, so it might not be

suitable for some types of foods. Additionally, there may be safety concerns associated with using this technology on certain types of materials due to its high electric voltage requirements.