APPROACHES FOR DELIVERY OF HEAT SENSITIVE NUTRIENTS THROUGH FOOD SYSTEMS FOR SELECTION OF APPROPRIATE PROCESSING TECHNIQUES: A REVIEW

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Abstract

Food contains many heat sensitive nutrients which include vitamins, minerals, and nutrients having functional properties such as pigments, antioxidant, Bioactive compounds. Many processes during manufacturing of food cause detrimental effects on these nutrients. Retention of these nutrients in food products requires innovative approaches for process design because of their sensitivity to a variety of physical and chemical factors, which causes either loss of biological functionality, chemical degradation and premature or incomplete release.

This article reviews effect of Different Processes on Heat Sensitive Nutrients and approach for selecting appropriate processing technology. Proposed target application of nutrient is first analyzed using scientific principles, including materials science, physical chemistry and biophysics. The scientific understanding is used to develop a range of potential solution strategies from which the most feasible is selected for further development. Based on technological considerations, such as cost, ease of manufacturing, adaptability, one of these various possible solutions is finally implemented in the actual food product.

The major advantage of Retro-design approach is that it does not focus from the outset on a specific technology. Application of Sensitive Nutrient is placed at the centre and from there systematically works back to find a feasible technology to introduce or retain sensitive nutrient in the food product.

A wide selection of delivery systems is available for the use in food systems. Ultimately, one would like to relate the characteristics of the delivery systems to the functional attributes of the final product, such as sensory, physico-chemical and biological nutritional impact. Studies have shown that use of Novel Thermal as well as Non-thermal processing techniques such as Pulsed X-ray Processing, Oscillating Magnetic Fields, Low-Temperature Plasma, Ozone processing, Dense-Phase Carbon Dioxide Processing of Fluid Foods, Ultra-sound Processing of Food, High Voltage Arc for better retention of Sensitive nutrients.

***Key words**: Nutrient delivery system, Food system, Heat sensitive nutrients, Retro-design approach, Processing impact, Non-thermal processing techniques.*