Journal of The Gujarat Research Society

ISSN: 0374-8588
Volume 22 Issue 1, January 2020

A REVIEW PAPER ON FOOD SAFETY AND QUALITY

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Abstract

This analysis provides an overview of the effect on food safety, efficiency, and the climate of novel non-thermal food technologies. It confirms that the key goal of research in this area is to examine the microbial and/or chemical aspects of food safety. Recent study, however, indicates that certain negative (quality-oriented) characteristics exist in spite of different food safety benefits. Finally, this paper highlights the need for an environmental study of the use of these technologies.In interdisciplinary sciences, in biotechnology and in many other fields of study and application, non-thermal technologies are used. They are used mostly for preservation in the handling of food and waste water in food production. In addition to the negative impact of heat on the nutritional properties of food, consumer demand for minimally processed foods is making non-thermal processing common in the food industry. Ensuring food safety is the key challenge of non-thermal manufacturing, and research efforts are focused on microbial inactivation, food safety, and preservation while preserving the quality of the products collected..

Keywords: *Food, Non-thermal, Research, Safety, Technologies, Efficiency, Preservation.*

I. INTRODUCTION

These manufacturing systems have the ability to reduce treatment time, lower energy usage, and lower carbon footprint, in addition to food safety and quality dimensions. In the form of research manuscripts, book chapters, conference proceedings, as well as patents, regulations, and even company studies, online literature on the use of non-thermal technologies in the food industry is distributed in a heterogeneous way.In accordance with our purpose, for the period 2000-2018, we conducted research in scientific literature spanning the research[1].

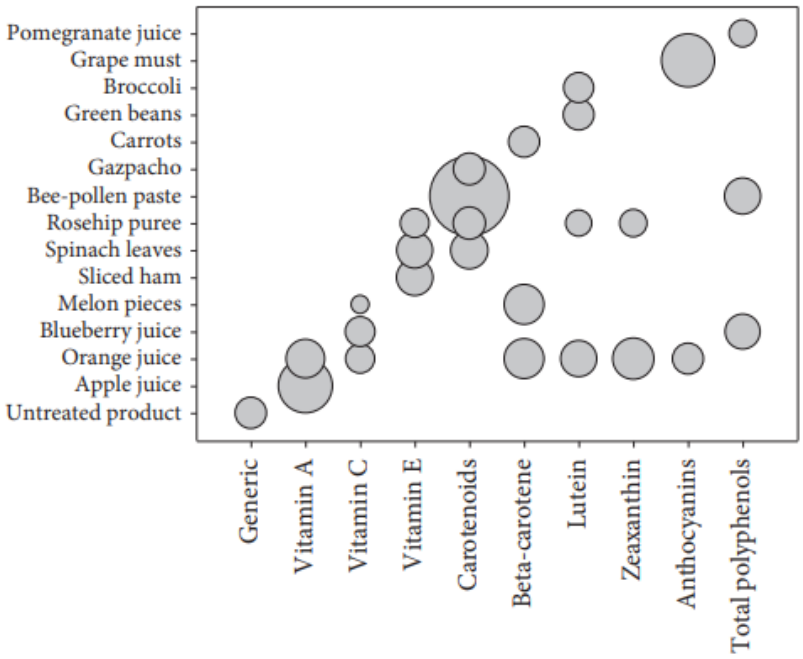

Figure 1: Illustrates the High-pressure processing[2]

The authors based their attention mostly on foreign journals to ensure more scientific content, which was partly due to a thorough review process. The collection of scientific manuscripts was therefore based on the impact factor of journals, corresponding to the journal scope and choosing those indexed by international repositories, such as the Scopus index and publishers (Elsevier, Springer, Wiley, Taylor and Francis, and EBSCO)[3].

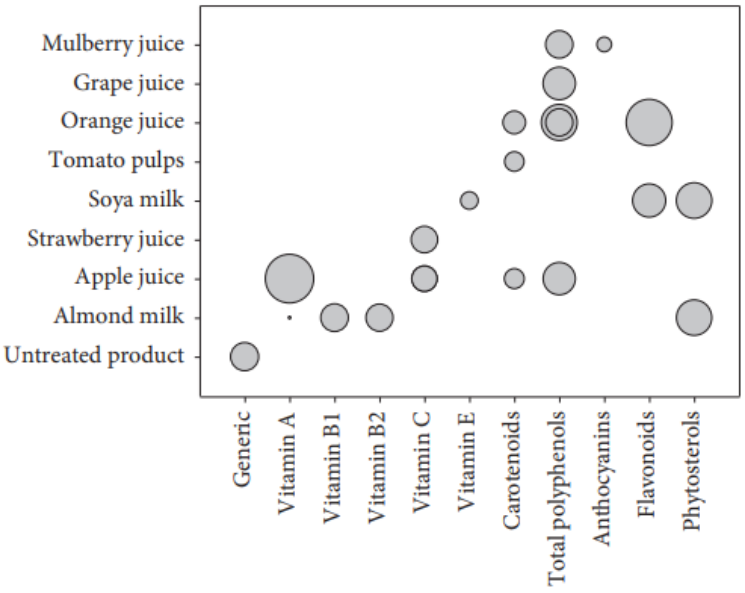

Figure 2: Illustrates the high-pressure homogenization[4]

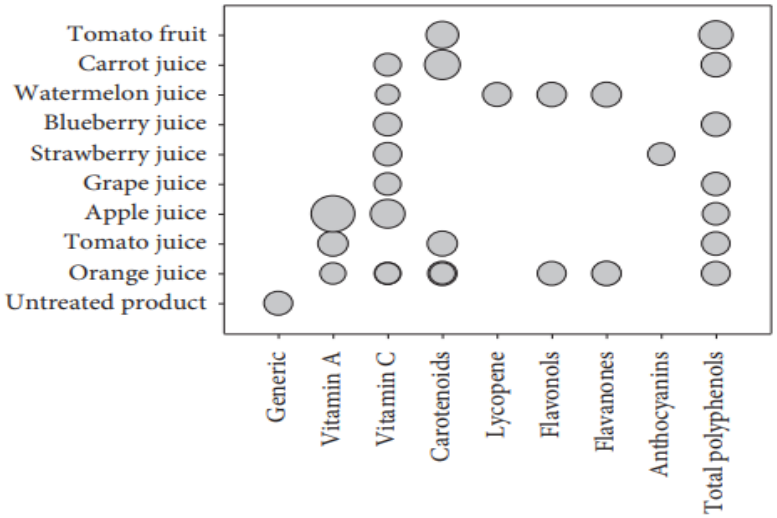

Figure 3: Illustrates the pulsed electric fields[5]

II. DISCUSSION

Sonication at lower frequencies of 20 kHz causes mechanical effects as a result of increased pressure gradients formed during the collapse of cavitation bubbles inside or near the bacteria, resulting in increased shear forces, micro streaming and high levels of mixing, resulting in bacterial disruption. Evidence for the use of ultrasound in deactivating and sterilizing several different strains of bacteria continues to expand. This can be achieved within short treatment times with higher frequencies of sonication, thus resulting in minimal disruption to the food material itself[6].

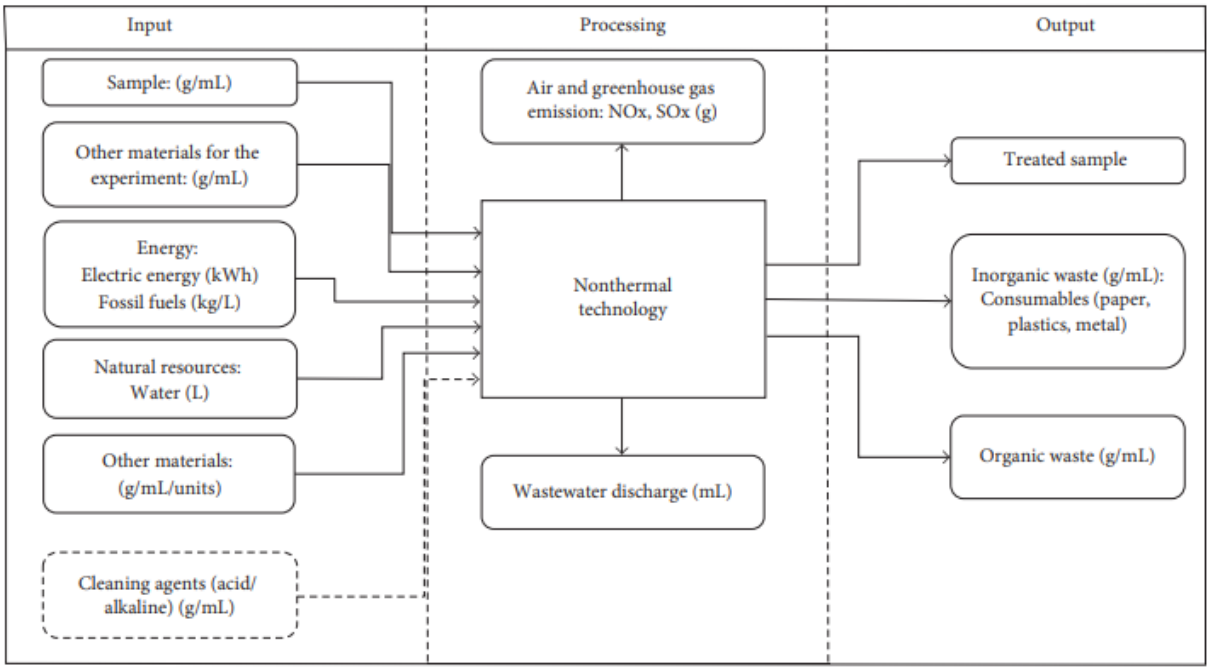

Figure 4: Depicts the generic model of using nonthermal technologies[7]

This poses the first challenge of successfully inactivating microorganisms thus impairing the quality and sensory parameters of treated samples and opens up a research gap in un-researched areas, such as negative aspects of the application of novel non-thermal processing to food quality, food stability after non-thermal processing during shelf life, negative sensory properties of food treated by novel non-thermal processing[8]. The advantages in terms of energy consumption of novel non-thermal processing can be considered as "green" techniques for "green" extraction. It is important to take an overview of processing in terms of safety, quality and environmental aspects, in order to obtain better production products using non-thermal processing.Figure 1 illustrates the High-pressure processing. Figure 2 illustrates the high-pressure homogenization. Figure 3 illustrates the pulsed electric fields. Figure 4 depicts the generic model of using non thermal technologies[9].

III. CONCLUSION

Food-processing equipment legislation on hygienic construction is quite ambiguous. Given that a large number of different types of standards and regulations related to hygienic design exist and due to the redundancy of certain specifications, a compact method is more than sufficient to test novel technologies.In the future, studies relating to the comparison of the environmental impacts of novel and conventional technologies will have to go in two directions: I improving the environmental performance of non-thermal technologies per se; and (ii) comparing environmental aspects of non-thermal and conventional technologies, together with weighing other factors such as the quality of the final product or the cost of investment. Sterilization and elimination of contamination by bacteria and other microbes are another area of safety concern within food production. In treating the rate of bacterial growth and increasing the kill rate of microbes at a variety of frequencies, ultrasound has been shown to be very effective, the most effective being 850 kHz due to the short life span of the cavities at this frequency. Microbial inactivation is thought to be caused by the weakening or disruption of bacterial cells through a variety of distinct mechanisms that involve mechanical and chemical effects

IV. REFERENCES

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ISSN: 0374-8588
Volume 22 Issue 1, January 2020

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