



Final Year Project Showcase Batch 2018 Year 2022

Department: Food Engineering		Programme: Food Engineering
1	Project Idea	To preserve fruits juices using ultraviolet treatment with retention of nutrients
2	Process	A UV treatment unit was designed and used to test the effectiveness of UV-C radiation for killing bacteria (aerobic bacteria and yeast and molds in watermelon juice. After receiving UV-C treatment, the effects on the juice's microbiological load, °brix, pH, and color (L, a, and b), were assessed for 21 days of storage at 4±1 °C
3	Outcome	*Microbiological safe liquid food with minimum use of energy. * Nutrient retention was increased in comparison to conventional process.
4	Evidence (Theoretical Basis)	Juice is mainly extracted by squeezing or pressing the fruit to draw out the juice, further preservatives and additives are added to make it taste better, enhance the color as per to appeal to the customer, and fundamentally escalate the shelf life of juices. The consumption and production rate of juices is increasing rapidly as days are passing by, thereby it is essential to keep it preserved in an optimizing environment. Normally these juices were conserved by the thermal techniques but due to high-temperature treatments the juice loses its nutritional values, moreover, it normally deteriorates the quality hence making the complete process useless. Consequently, to overcome this problem the use of non-thermal radiation technology such as ultraviolet is a go-to alternative for conventional treatments and shelf-life extension for juices for the last decade. Ultraviolet (UV) with a germicidal effect at a wavelength of 254 nm tends to inactivate a wide spectrum of microbial pathogens. The chief purpose of this project is to increase the shelf life of juices by the synergistic effect of UV with pre-mild heat treatment.
5	Impact on Sustainability of Urban Regions or SDG-11 "Sustainable Cities and Communities"	It can impact urban regions by providing safe food with low cost. Thereby, it can prevent outbreaks. Ususally, fresh juices are sold with any treatment and pose a serious risk of food poisoning. This project can provide low cost treatment unit to treatment juices and therby, can prevent possibilities of food poisoning.
6	Competitive Advantage or Unique Selling Proposition	Cost Reduction, Process improvement, Good health and well being
a	Attainment of any SDG (e.g. How it is achieved and why it is necessary for the region)	SDG#3 Good Health and Well-being: Microbiologically, safe food are good for health. This project can provide pathogen free food with retention of nutrients.

		SDG#6 Clean Water and Sanitation: It can reduce microbial load for any pumpable liquid foods and can be used for water
b	Environmental Aspect (e.g. carbon reduction, energy-efficient, etc.)	A energy efficient process with low carbon footprint.
c	Cost Reduction of Existing Product	It can reduce process operating cost by more than 90 % in terms of energy consumption
d	Process Improvement which Leads to Superior Product or Cost Reduction, Efficiency Improvement of the Whole Process (e.g. What is the issue is current process and what improvement you suggests)	Normally, juices are conserved by the thermal techniques. But due to high-temperature treatments the juice loses its nutritional values, moreover, it normally deteriorates the quality hence making the complete process useless. Consequently, to overcome this problem the use of non-thermal radiation technology such as ultraviolet is a go-to alternative for conventional treatments and shelf-life extension for juices for the last decade. Ultraviolet (UV) with a germicidal effect at a wavelength of 254 nm tends to inactivate a wide spectrum of microbial pathogens
e	Expanding of Market share (e.g. how it expand and what is the problem with the current market)	It will improve food preservation and thereby, can reduce wastage
f	Capture New Market (e.g. Niche market or unaddressed segment)	Minimally processed foods with high nutrition value and low cost process
g	Any Other Aspect (Please tag it like above options)	To pastuerize pumpable liquid food products
7	Target Market (Industries, Groups, Individuals, Families, Students, etc) Please provide some detail about the end-user of the product, process, or service	Fruit juice manufacturers
8	Team Members (Names along with email address)	Fatima Chaudhry (chaudhry4106631@cloud.neduet.edu.pk) Hafsa Naveed (naveed4108927@cloud.neduet.edu.pk) Hira Jawaid (jawaid4106735@cloud.neduet.edu.pk) Umema Afzal (afzal4102161@cloud.neduet.edu.pk)
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10	Pictures (If any)	