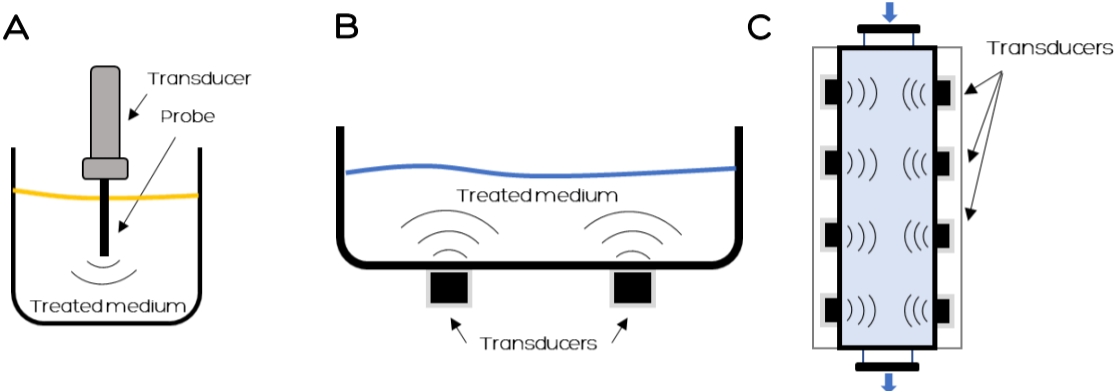


Ultrasonic Technology in Food Industry

Ultrasonic treatment (US) is a non-thermal processing technique that uses sound waves

US can operate in multi-frequency systems: Low (<20Hz) and High (>20Hz) frequencies

Development of portable US systems enable on-site processing



Scheme of three different US operation modes: A) US probe; B) US bath; and C) US flow cell (continuous).

Adapted from: <https://www.intechopen.com/chapters/70675> & https://www.researchgate.net/figure/Ultrasonic-systems-typically-used-for-sonochemical-treatment_fig2_279764070

General Pros & Cons

- Improved food safety and shelf-life by reducing pathogens and promoting enzymes inactivation
- US can be used to improve texture, flavor and appearance of food products
- Reduced energy consumption
- US can be used to speed up several processing steps
- Increased sustainability, by reducing the use of chemicals and other additives

- US is not suitable for all food matrices (e.g., fragile products)
- High purchase and maintenance costs
- US may impact nutritional and quality changes
- Safety concerns related to the use of high-frequency sound waves

Extraction

Efficient extraction of flavors, aromas, and other compounds (e.g., vegetables, algae)

Preservation

Extended shelf life by reducing the activity of enzymes and microorganisms in food products

Thawing

More efficient and faster thawing of frozen food products, reducing the risk of contamination (e.g., meat)

Dehydration

High efficiency and faster water removing from food (e.g., fruits)

Mixing/Blending

More efficient in ingredients mixing while improving the consistency and homogeneity

Emulsification

Development of stable emulsions, by breaking down the surface tension between oil and water (e.g., mayo)

Ultrasound Applications in Food Industry



Latest Food Product Launches using Ultrasonic Technology



Himalayan Salt 2022



Daily Milk 2022



Mushroom Coffee 2022



Ultrasonic Gin 2021