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**Inactivation of Escherichia coli by ultrasonic irradiation.**

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Ultrasonic inactivation of Escherichia coli XL1-Blue has been investigated by high-intensity ultrasonic waves from horn type sonicator (27.5 kHz) utilizing the "squeeze-film effect". The amplitude of the vibration face contacting the sample solution was used as an indication of the ultrasonic power intensity. The inactivation of the E. coli cells by ultrasonic irradiation shows pseudo first-order behavior. The inactivation rate constant gradually increased with increasing amplitude of the vibration face and showed rapid increase above 3 microm (p-p). In contrast, the H<sub>2</sub>O<sub>2</sub> formation was not observed below 3 microm (p-p), indicating that the ultrasonic shock wave might be more important than indirect effect of OH radicals formed by ultrasonic cavitation in this system. The optimal thickness of the squeeze film was determined as 2 mm for the E. coli inactivation. More than 99% of E. coli cells was inactivated within 180-s sonication at the amplitude of 3 microm (p-p) and 2 mm of the thickness of the squeeze film.